

The Sight-Saving Review

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Control of Chemical Eye Injuries

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Industry has an enormous stake in the prevention and treatment of eye injury and disease. Only when management, safety and medical personnel work as a team will the success of the eye program be assured.*

EYE injuries are an employment risk in industry regardless of the size of the plant or the nature of the production involved. Proper control measures, however, will to a great extent reduce their frequency and seriousness.

In this discussion I will deal briefly with our eye injury experience in an industry devoted primarily to the production of chemicals and pharmaceuticals; outline specific treatment for certain types of injury; and describe methods generally used in our protection program.

Eye Injury Record

There are approximately 4,500 employees at our Rahway plant. During the year 1952 over 1,200 reported to the plant health department with eye complaints, almost 950 of which were due to foreign bodies. There were 9 cases of conjunctivitis secondary to ultraviolet light and welding arcs;

only 3 severe contusions of the eye during the year and 26 minor cuts and abrasions. There were 145 cases of irritation to the anterior segment of the eye due to chemical exposures, and 100 cases in which actual burns of the eye were present. I should like to confine my discussion to these groups in which the eye surface was involved by chemical irritation and burns.

Corneal Damage

There is no surface on a human being comparable in value to that small bit of transparency which we call the cornea. The scratch, the abrasion, the minor burn, the surface injury that all of us consider trivial when it occurs elsewhere on the body may modify vision when the eye is involved to an extent that can be appreciated only by those who work with individuals handicapped in this vital way.

Chemical dusts, liquids or fumes affect the surface of the eye in a number of ways. One of the major changes that can be produced is a modification of the protein in the corneal tissue as a

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

result of excessive acidity or alkalinity of the offending material. Again, the injurious agent may occasionally combine with special groups in the protein molecule without any change in the acidity or alkalinity. Local sensitivity or allergy may result in such contacts so that minute amounts of the offending agent may later produce an inflammatory reaction. Also, other chemicals striking the surface of the eye are capable of dissolving the transparent epithelium while penetrating the eye. This capacity at least partially explains the greater severity of sulphuric acid burns in the group of acid splashes, and why alkalis penetrate the eye more than acids do and so tend to produce more damage. Soaps, detergents, bile, etc., may act in this way and to a lesser extent alcohols, ethers, acetone, and other ketones.

Purpose of Treatment

The degree of insult determines, all other things being equal, the intensity of the healing action. The healing process when marked is associated with scar, and scar formation reduces vision. The purpose of treatment is to remove the offending agent before it can do harm, to minimize damage already produced, and to attempt to decrease the intensity of scar and adhesion formation during healing.

Some chemicals and physical agents such as ultraviolet are insidious in the production of symptoms. A latent period of almost a day after exposure may be followed by the development of obvious signs and complaints, but most chemicals begin to be annoying at the time of contact. This is the time that treatment begins and the efficiency of therapy is directly proportional to the speed with which me-

chanical flushing procedures are instituted following the accident.

Emergency Measures

All our employees are informed that they should immediately irrigate the eye with copious streams of cold water after an ocular injury. For their convenience water sources are scattered throughout the factory area. The location of these and their importance is impressed on all the men by supervision as a staff function.

After such preliminary irrigation the employee is sent to the plant health department where further irrigation for a period of not less than 30 minutes with either normal saline or distilled water is then instituted. The eyelids are held widely open while the irrigating solution is allowed to flow from the outer sections of the eye to the nose. All personnel of the department have been taught the technique in this procedure and the risk involved in excessive force. If pain and spasm of the lids make irrigation difficult, a local anesthetic is used immediately to facilitate this act. The pH of the eye secretions is checked and then rechecked at intervals. If on the acid or alkaline side irrigations are continued until neutrality is obtained. The attainment of such neutrality, however, is no reason to stop the irrigation. It is interrupted at this time, however, while 2 per cent fluorescein is instilled in the eye which is then inspected in a dark room under the light emitted from a filtered ultraviolet lamp. In irritations where the corneal and conjunctival surfaces remain intact, the dye reveals little, but when there is an actual burn the fluorescein, which settles where the surface has been denuded, shows up brightly under the

lamp. Thus the area and the depth of the burn can be quickly estimated. Therapy then depends on the extent of visual damage and the nature of the known offending agent.

Continuation of Treatment

Irritations are usually treated by cool compresses of normal saline applied for 20 to 30 minutes in a darkened room. This is repeated as frequently during the day as the plant physician deems necessary. Hydrocortone acetate drops are instilled once each hour. Pain is alleviated by systemic medication and if a local anesthetic is required it is used sparingly. If spasm of the lids and pain are not immediately relieved atropinization of the eye is also instituted. Dark glasses are issued to patients to wear when they are not under active treatment especially when a local anesthetic has been used. Under such a routine most ocular irritations are markedly improved in 24 hours.

Further treatment in the case of burns usually consists of placing the patient in a darkened room, dilating the pupil with atropine, and applying continuous cold compresses of normal saline or distilled water intermittently 4 or 5 times during the day. Drops of a solution such as sodium sulfacetamide placed into the eye after the compresses, or an ointment of bacitracin or neomycin at night, usually provide the means for reducing the complication of infection. We attempt to control pain by the use of drugs taken internally, but we will also use local anesthetics if systemic therapy proves inadequate. We do make an attempt, however, to keep the use of topical local anesthetic drops and ointments to a minimum because of the softening

effect upon the corneal epithelium.

By such means the great majority of chemical burns of the eye are sufficiently treated. Lately we have added to this routine the use of hydrocortone acetate applied as a single drop once an hour during the treatment period. We are under the impression that pain is reduced and the inflammatory reaction minimized without interfering with healing when this medication is used. We are aware of the treatment of ocular burns by the use of hydrosulfosol and ointments, plus patching, but are not convinced that results obtained by such methods of therapy are better than ours.

Of over 100 cases due to burns in 1952, only one under this routine developed a scar sufficient to affect vision materially.

Burns that are deep enough to penetrate into the anterior chamber or involve the iris require the constant care of an ophthalmologist and are never treated beyond the point of first-aid therapy by our staff.

Eye Protection Program

I will mention briefly some of the measures our safety department uses in preventing eye injuries.

All personnel in the laboratories are required to wear safety glasses. When they are performing operations with corrosives or eye-toxic chemicals, chemical goggles and/or a nitrometer mask are required. These glasses are furnished by the company and if the individual requires lenses to correct refractive errors each individual furnishes the correct prescription at his own expense. The company also provides weekly services of a certified optometrist who adjusts each individual's spectacles. Every four to six

weeks the safety department conducts a spot check of each laboratory and at the last check found that 75 to 80 per cent of the personnel were abiding by the regulation.

In the factory areas each process or operation is studied by the safety department and the supervisors and the proper eye protection is recommended. Should eye injuries become a problem in any certain factory or division area, a meeting is held and more investigations and recommendations are made.

Along educational lines special posters are devised to emphasize any troublesome phase of the eye protection program. Recently Merck & Company has been issued a charter for the Wise Owl Club of America. In the

monthly report of our safety department all eye accidents are publicized and suggestions made for preventing their recurrence.

In summary I wish to re-emphasize the great obligation management, safety and medical personnel have in the control and prevention of these chemical injuries. The old adage "to err is human" should make us all ever more watchful and diligent to see that those under our supervision do not "err" when it comes to the welfare of their vision. In our experience the promptness and speed with which the emergency and more definitive measures are carried out, when chemical injuries have occurred, are of utmost importance in lessening damage.

Atom Bomb Effects

Naval and Air Force physicians and scientists reported in the April 1953 issue of the *Military Surgeon* on the effects of atomic radiation on vision.

The lethal effects of ionizing radiation from the type of bomb used at Hiroshima are confined to less than one mile from the target. Skin burns from the heat generated by the blast may be produced within a two-mile radius. However, the lens action of the eye can result in serious ocular damage at a distance of four miles from the blast. An eye focused on a bomb four miles away at noon would receive twice the amount of heat which would char and shrivel flesh; at night the dose would be eight times as great. Blinking or glancing away from the blinding light takes one-tenth of a second, while the heat radiated reaches its peak in 1/10,000 of a second. Thus, by the time the eye can protect itself,

37 per cent of the bomb's total radiation has been emitted, and an injurious dose has been received. Such injuries to the eye result only if the victim happens to be watching the precise point of explosion. Among atom bomb survivors in Japan, contrary to expectation, only a small percentage of those suffering from "radiation cataract" have shown irreparable loss of vision.

Newer bombs with greater power would be injurious to the eye at greater distances. The hydrogen bomb would probably blind anyone at any distance from which it could be seen.

Annual NSPB Conference

March 10-12, 1954

Hotel Jefferson

St. Louis, Mo.

Management-Union Teamwork for Eye Protection

W. MICHAEL AICHER

Director, Employee Relations
United States Brewers Foundation

In no phase of industrial life is there greater possibility for agreement, for singleness of purpose, than in accident prevention.*

CONTRARY to the impression which might be gained from published accounts of disagreement between American industrial management and labor unions, closer study will inevitably reveal more agreement than discord, more teamwork than strife. And basic beliefs in the principles that guide our great nation are shared alike by management and labor.

How often have we heard leaders of industry or of labor refer to the relationship between owner and worker, management and employee, as a partnership? And when have we last heard an industrial leader advocate scrapping unions, lowering wages, or reducing our standard of living? Instead we look forward to ever-improving standards, maturity and greater responsibility in unions, higher productivity and greater participation in our profit system by more and more of our people.

Our goals are all positive. In our

pursuit for happiness, we are *for* something; we believe in something and will struggle to attain it.

In no phase of our industrial life is there greater possibility for agreement, for singleness of purpose, than in accident prevention. Here is the perfect medium for wholehearted, sincere teamwork. In the brewing industry we have tested the willingness of labor unions to cooperate with employers in making jobs safer for our employees. And with rare exception we have not found them wanting.

Soon after our board of directors authorized the United States Brewers Foundation to conduct an intensive industry-wide accident prevention campaign, we made known our plans to the heads of the labor organizations that have long represented our workers. Their response was enthusiastic and genuine; and ever since their first pledge of cooperation we have received their complete support. Intelligently, the national officers are not forcing the action of all locals. Their policy is clear and it remains for locals

* Digest of a paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

to work out with individual employers the solution that is most likely to produce best results.

Three Approaches Used

Thus we find a good sampling of labor contracts which call for a joint management-union safety committee. Where the employer and the local believe this arrangement will best meet their needs, they are given every encouragement to proceed, and can call upon international union officers or our office for advice and assistance for the implementation of their programs. In some instances the employer assumes full responsibility for the leadership and guidance of a safety program, and there the union's cooperation is just as real in carrying out the prescribed safety practices. We have even

come upon a few situations in which the employer relied upon the union and his employees to give formal leadership to a safety program, reserving to the management the manner and timing of carrying out the recommendations and advices of the union safety committee.

Three distinctly different approaches to accomplish the same result—and all depend upon teamwork. As in other successful ventures, the objective is clearly defined, the benefits are real to employee, employer and the community. On that kind of solid foundation the promotion of management-union teamwork requires less genius than it might in other phases of the industrial relationship, and points the way for similar action in the other admittedly more vexed areas.

Color for Comfort and Safety

Intelligent use of color in industry pays off in reduced nervous tension and eyestrain, lowered absenteeism, and reduced accident rates. These effects are due both to psychological and visual factors, according to an article by Howard Ketcham in the June 1953 issue of *Safety Maintenance and Production*.

Improper color and lighting takes its toll in eye fatigue. Visibility depends on good illumination with glareless lighting and clear but restful contrasts. Good reflecting colors, particularly white, cream, ivory, and pale blue, usually give greatest worker efficiency and lowest light bills.

Contrast and visibility of certain colors, notably yellow and orange, make them well suited for painting vehicles and marking roads. Studies of

the use of color in aviation indicate that glossy sea-blue paint on wing surfaces improve the visibility of aluminum planes, and that reddish orange is excellent for recognition at a distance. The color of airport runways is important; brilliant white, which reflects heat as well as light, presents a landing hazard by reflecting hot updrafts. Reds, browns, or greys are best suited for runways.

The author states that in modern schools designed for optimum illumination, tan or dull grey walls are disappearing; color has made the slate grey blackboard obsolete; they are being replaced by green boards. Colors are in use which eliminate glare, diffuse light, and exert a relaxing influence, thus diminishing eyestrain, tension, and fatigue.

Improving Vision Among the Blind

PETER J. SALMON

Executive Director, The Industrial Home for the Blind
Brooklyn, New York

About 50 per cent of the persons classified as blind have some remaining sight. Studies show that their vision can often be improved through the use of special optical aids and color schemes that provide good contrast.*

AT the Industrial Home for the Blind we conduct among other services an extensive program of industries. In 1942 we had the good fortune to secure the services of the noted engineer, Dr. Lillian Gilbreth in the formation of a committee to review all of our industrial standards. The first survey was involved with our lighting system which, as we were fully aware, was inadequate.

Dr. Gilbreth called into service the engineers of the General Electric Company; she also asked the Pittsburgh Plate Glass Company to advise on paints and colors that were essential to our lighting system. In addition we had the full cooperation of the Prevention of Blindness Service of the New York State Commission for the Blind and the National Society for the Prevention of Blindness.

Improvement in Lighting

After much experimentation with both incandescent and fluorescent

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

light, and with varying paint surfaces and colors, the committee settled upon a system which we think is one of the finest of its kind. It has been used as a model by the Consolidated Edison Company in its discussion of industrial lighting throughout the metropolitan area. It is a simple system depending on a high level of general illumination—30 to 50 foot candles—and a gloss-free paint surface, avoiding glare and shadows.

Experimentation showed us that for contrast helpful to limited visual acuity a soft vista green as background and a fairly sharp orange for spot coloring were the most effective. This has proved to be excellent for our industrial purposes, but it is not the kind of color and lighting one would want in the living room, and a different approach to adequate lighting for limited vision in the home is indicated.

We found that in order to secure the level of illumination we needed incandescent lighting would create a problem of heat, perhaps increase the temperature of the rooms in summer-

time as much as 15 degrees. We were therefore compelled to use a cold type of light and adopted a series of fluorescent tubes placed on eight-foot centers. The general effect achieved was that of north sky light. It would be much easier to accomplish this today with some of the newer forms of cold light than it was in 1942 and 1943, when we developed our plan. We have installed one of these newer systems in our club house, using a cold cathode battery in series of six-foot centers.

Reaction of Workers

In view of the varying types of eye conditions among those working in the shops, it was expected that they would show some resistance to this new lighting. We were very pleasantly surprised when it appeared that only a few failed to be delighted with it and even these adjusted without much trouble. The effect on the over-all group was immediate and most satisfactory. The ease with which they were able to get about, the reduction in minor accidents, and the general lift to morale were outstanding.

It is very costly to maintain a lighting system such as we have in our plants, but the benefits far outweigh the additional expense. We look back on this major progressive step with a great deal of satisfaction because it represented the first in a series of important advances which we were able to make. For example, we have installed automatic and semi-automatic machinery and various devices that reduce stress and strain in the physical effort necessary to produce goods. A number of eye conditions impose limitations of work on the individual; certain movements of the body, bending, etc., must be mini-

mized or avoided. We have studied this problem carefully and have reduced these physical efforts to a minimum. It is interesting to note that since this program has been put into effect we have had no further aggravation of retinal detachment or glaucoma cases.

Systematic Medical Care

At the Industrial Home for the Blind our primary concern in preventing further blindness and preserving vision is a complete program of medical care. We maintain a clinic which works closely with all of our service departments in diagnosing and planning a program of work and living for each client we serve. The ophthalmologist and the physician, and even the dentist and the nurse, are exposed to the industrial program for long periods of time so that they will be familiar with the conditions under which the client works. Thus they are able to diagnose and prescribe work tolerances related to specific jobs, jobs which cannot be assigned by the management without this knowledge.

Our approach to improving the sight of blind persons is based on a philosophy which applies to all aspects of our service and which in fact is three-pronged. The creative, the research and the corrective approaches must be utilized, as in all other avenues of service: education and indoctrination; the bringing together of all devices, appliances and thinking that may aid in the improvement of vision; and finally, the application of these findings to individual needs.

Education Sometimes Difficult

It might appear that it would be totally unnecessary to educate a per-

son with some usable vision to better use of that vision, but actually that is one of our most difficult tasks. Many of our clients have lived with little sight for so long that they do not feel the need nor realize the possibility of correction. Research on this problem has been a hit-or-miss matter until recently and at the Industrial Home for the Blind we have only started to formalize our thinking on it during the past several months. We have assigned a staff member to the accumulation of information and all devices concerned with the correction of limited visual acuity. Various lenses and projection devices have been assembled, and we have been discussing the problems with ophthalmologists and optometrists. We are working closely with the American Foundation for the Blind which has set up a similar study and has accumulated probably the most extensive library of information available today.

We plan to have our ophthalmologist screen blind persons with some vision and select those he feels can be tested for special correction through magnification or telescopic lenses. We feel that this process is so time-consuming that it will never be completed unless some skilled person other than the eye specialist is assigned to work with the individual client, spending as much time as necessary to determine the best possible corrective device. When the eye aid has been selected the client will be referred back to the ophthalmologist for approval and prescription. Correction may sometimes be a limited thing, possibly giving the client only the ability to tell time or to look up a word or phrase, but to a person with 2/200 vision, for example, who has not previously been able to do

this, the thrill is beyond measure. While the results may not fully meet our expectations, we believe that the formalized approach to this neglected area is bound to focus attention on it, and eventually to result in great benefits.

In the past innumerable experiments in this field have been carried forward without relation to each other, some of them identical. If all who are interested can learn what has already been accomplished, it will be easier for them to work constructively. That is why we are trying to collect and disseminate as much information as possible on the more practical aspects of correction.

I might add a personal note to account for my enthusiasm on this subject. I have with correction 15/200 in both eyes, and am classified as blind. For many years I have been struggling with magnifying glasses and have always developed headaches and nausea from extensive reading. A few years ago, through the kind of painstaking effort that I have just described, I was able to secure a set of Kollmorgen telescopic lenses. With these I obtained sufficient correction so that I can now read practically anything indefinitely without discomfort. Incidentally, with my improved far vision I was able to see a ball game for the first time. For you who see without difficulty this would seem like a relatively unimportant thing, but for me it has made the difference between night and day—in fact, for me it has meant a new life.

EYE FACTS—Neglect is the greatest single cause of blindness in America today. The best precaution is a competent professional eye examination.

Blasting Caps Blind Children!

RECENTLY in an Iowa classroom an 11-year-old boy traded a notebook for a small object one of his friends had found in a neighboring field. The object was a shiny metal cylinder and the boy was anxious to find out what it contained. About the time school was to be dismissed he took out his pocket knife and began to investigate. Suddenly there was an explosion that rocked the classroom. The boy was killed. He had traded his notebook—and his life—for a dynamite cap.

Eye physicians in various parts of the country have recently reported a number of similar accidents in which children were blinded. These tragic losses of sight are often associated with severe injuries to other parts of the body—hands, arms and legs.

The caps are sometimes left lying on the ground through carelessness of workmen in blasting operations; sometimes they are lost or stolen.

A Texas physician who is deeply concerned about the problem writes about a case seen recently:

"A 15-year-old boy used a dynamite cap and a shotgun to blow up some rocks. I saw the child 15 minutes after the accident. Both eyeballs were ruptured, vitreous was lost and now the best vision is light perception in one eye. To say one is distressed . . . is to express it mildly. I feel it is my duty to go into action . . . to prevent similar future accidents."

Several doctors who have seen many of these cases are endeavoring to bring this serious problem before state legislatures so that better control of the dangerous caps by their users may be effected.

An NSPB study of causes of blindness among children of school age, as of 1949–1950, revealed 33 cases of blindness due to injury from dynamite caps or dynamite. This is 11 per cent of the traumatic blindness in this age group. In one state there were two incidents, each involving several children playing with dynamite caps. In the first three cousins were blinded in both eyes. In the second two cousins were blinded in both eyes and four other children were blinded in one eye.

Educational Campaign

For many years the Institute of Makers of Explosives has been carrying on a vigorous educational campaign to acquaint youngsters with the dangers of blasting caps. This effort has been successful to a considerable degree. The Institute records show that during 1929 when 389,662,710 pounds of explosives were produced in the United States, there were 344 accidents to children from blasting caps. In 1952, when production doubled to 732, 201, 006 pounds only 80 children were injured. Thus the accident index of cases reported to the Institute has declined. However, it is a fact that some injuries are unreported, despite

best efforts of the Institute to gather this information.

During the first six months of this year 68 injury cases have been reported, a number involving the eyes. Four of these victims were girls, the rest boys. Children as young as five years have been maimed in these accidents which occur in urban as well as rural areas in all parts of the country.

Richard F. Webster, secretary of the Institute, says: "So long as even one accident occurs to a youngster during the year, our industry will continue to conduct the blasting cap

safety program. Very valuable assistance is being given by other organizations, such as 4-H Clubs, Boy and Girl Scouts, National Education Association, General Contractors Association, National Sheriffs Association, Future Farmers of America, Y.M.C.A., Y.W.C.A., the international associations of police and fire chiefs and others."

The Institute issues a poster featuring pictures of various types of blasting caps. Over 360,000 copies of this have been distributed during the first eight months of this year, and it has

Over 360,000 copies of this poster have been distributed this year by the Institute of Makers of Explosives to inform children about the dangers of blasting caps

been displayed in 41,000 post offices in the United States for a period of 60 days.

A film, "Blasting Cap!" produced by the Institute has also had a wide distribution to schools and television stations.

Comparatively few persons know what blasting caps look like. They are copper or aluminum cylinders about as big around as a lead pencil and between one-and-a-half and five inches long. They contain a highly sensitive explosive and are used to explode dynamite, to mine coal and metals, quarry stone, build bridges, roads and skyscrapers.

The "ordinary cap" is exploded by sparks from a burning fuse inserted in one end. The electric cap has two wires extending from one end which are connected by a very thin wire that is sunk in the explosive charge in the cap. When electric current is applied, the thin wire becomes red hot and detonates the cap.

Expert Handling Necessary

Only a highly experienced person knows how to handle the caps safely. When one explodes hundreds of small pieces of metal fly out in all directions, sometimes as far as 200 feet; and even at that distance they can cause blindness.

Boys and girls (as well as adults) should be able to recognize a blasting cap and understand the damage it can do. If they find one they should leave it alone, warn any persons who may be nearby and ask an adult to call a fireman, policeman, sheriff, or other law enforcement officer. Officers who are not thoroughly experienced in proper handling of such explosives without endangering themselves and

others are advised to get in touch with a county agricultural agent; the area headquarters of any major quarrying, mining or construction project; a representative of the U. S. Bureau of Mines, or a representative of an explosives manufacturer.

Prevention of blindness agencies and other organizations and individuals able to cooperate in the campaign to eliminate these tragic blasting cap accidents are urged to secure posters, leaflets, the film previously mentioned, and other material from the Institute of Makers of Explosives at 250 East 43rd Street, New York 17, N. Y. A local educational campaign in which all join in publicizing the necessary safety information will bring results.

WHAT'S FUNNY ABOUT A BLACK EYE?

Cold applications and time will cure most black eyes, but if vision is fuzzy or the eye is cut or painful it is wise to have a physician examine it to prevent serious permanent damage. In an article bearing the above title, which appeared recently in *Today's Health*, Dr. P. H. Fluck explained that although most black eyes are not serious, a tap on the eye—even a light tap—can be transmitted through the fluid contents with sufficient force to damage the retina. A tear or separation of the retina means blindness forever in that part of the eye unless natural healing or surgery can make the separated portion of the retina adhere to the tissue below.

To repair retinal detachments, tiny needles are inserted through the outer coats of the eyeball in the vicinity of the tear. Enough electric current is applied to each needle to supply the right temperature which will induce scar tissue to form. If the operation is a success the scar tissue will reunite the damaged retina with the underlying tissue. A number of operations are often necessary before vision is restored.

Sight Restoration and Conservation in Kansas

MARGUERITE BLASE

Medical Social Work Consultant
Kansas Department of Social Welfare

Through a broad integrated program of case finding, specialized medical and social service and follow-up, the state's division of services for the blind is improving the vision of many individuals and arousing general community interest in eye care.*

THE stories of Ann and Mr. A illustrate the services of the sight restoration and conservation program in Kansas:

At kindergarten age Ann was not a happy child. She had crossed eyes with an error of refraction and had lost considerable vision in one eye through disuse. She came to the attention of the school nurse because of her impaired vision and related difficulties in school. The nurse in turn referred the child to the social worker in the county department of welfare who is responsible at the local level for carrying out the services of the medical eye care program of the State Department of Social Welfare, division of services for the blind. As the expense of care was beyond the means of Ann's family, in which there were nine children, arrangements were made to have it provided through the eye treatment program.

First the social worker talked with

Ann's parents, explaining the medical services available and how they could be secured. The parents were interested in consulting an ophthalmologist and selected Dr. B in a nearby city. They proceeded with securing an appointment and taking Ann for the examination. The transportation could have been provided by the social worker but Ann's parents wanted to assume this responsibility themselves.

Dr. B advised surgery and told Ann's parents that the operation might not be very helpful to her vision but would help her immensely in social adjustment. This the parents found difficult to accept and returned home to consider the doctor's recommendation. They talked again to the social worker who supplied helpful information which the parents seemed to need and gave them the assurance of her interest and the fact that the agency was standing by.

With this help the parents returned to Dr. B with their acceptance of the recommendation for surgery. Dr. B so notified the state supervising ophthalmologist.

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

mologist on the staff of the division of service for the blind who authorized services as outlined by Dr. B. In the meantime the social worker had submitted to the state agency a certification of financial eligibility and pertinent social information. Surgery was immediately arranged and following this glasses were provided. Ann's vision was improved and her eyes straightened perfectly. She continues under eye care. Back at home and at school she is a happier child.

Special School Plan

Upon recommendation of Dr. B special educational materials were made available to Ann to assist in carrying out her school program. Large type books were provided by the division of services for the blind. The parents furnished special papers, pencils, crayons and other materials. The consultant on the state staff gave consultation to the school nurse and teachers on special physical arrangements within the classroom.

The county department of social welfare continued to be responsible for any follow-up service indicated with reference to Ann's medical eye needs. Social problems as identified become the concern of the social worker.

With the benefits of these special aids Ann's school adjustment improved. The teacher reports that she has been transferred from the slow learner group and is fast becoming the leader of the more advanced group. She continues to progress and is no longer considered a handicapped, slow learner.

Case of Mr. A

Mr. A, age 56, came to the attention of the county welfare department

when his vision became so impaired by a cataract that he was unable to continue his work as a trash collector in a small town in central Kansas. He had consulted an ophthalmologist who referred him to the county agency. The social worker learned that Mr. A's salary of \$165 per month was barely adequate to meet the basic requirements of his family of four. He did not want financial aid, but he was able to accept help in providing for the needed eye surgery. He could arrange for a brother to take his job during this period. The brother would live in the home and provide for the family.

The county department of social welfare notified the state department that Mr. A was without resources to provide for medical eye care. At the same time the ophthalmologist submitted the required reports to the state supervising ophthalmologist who gave authorization to proceed with surgery and arrangements for related medical services. The surgery was performed and Mr. A's vision improved. He was able to return to work.

Growth of the Program

These case stories illustrate the substance and justification of the eye treatment program, a major aspect of sight restoration and conservation in Kansas. It appears to be a small program when costs and case load are compared with other public welfare programs. From 1938 through 1952, \$384,616 was spent on eye care for 3,071 persons. These are not large figures in comparison but they do not belittle the program's importance.

What was the origin of the program and how did it develop through these years? Its legal basis is found in the Kansas Social Welfare Act of 1937

which conformed with federal requirements for the assistance category of aid to the blind. An enabling clause made possible the establishment of a department of services to the blind within the newly created State Board of Social Welfare and the development of programs for the restoration of eyesight, prevention of blindness and the vocational rehabilitation of blind persons.

It became apparent from the instructions issued by the Federal Security Board that a state supervising ophthalmologist and eye examiners would be needed with regard to determining the visual eligibility of aid to the blind applicants. Consequently, in cooperation with the Kansas Medical Society and the local county medical societies the State Board of Social Welfare appointed a state supervising ophthalmologist and set up a panel of examiners, specialists in diseases of the eye, or eye, ear, nose and throat, trained and licensed to practice medicine in the state of Kansas.

Although the reviewing of eye examinations for aid to the blind was the primary interest at this point, everyone concerned was aware that a treatment program to restore eyesight would soon follow. The staff of the newly created division of services for the blind adopted as its first and major objective the establishment of such a program. Funds for this were set aside by the State Department of Social Welfare and later the amount was increased by legislative allotment. The new program provided that the entire cost of the medical service for restoration of vision among recipients of aid to the blind was to be borne by the State Department of Social Welfare. As examinations for eligibility

were received a file was set up indicating the need for medical care. It was apparent that a large number of these applicants had operable conditions with good prospects for restoration of vision. The State Department of Social Welfare began thinking concretely of a sight restoration program and a committee of ophthalmologists was designated by the Kansas Medical Society to serve in an advisory capacity in this endeavor. This group, known as the conservation of eyesight committee, has continued to serve.

Extended Service

It was soon evident that certain persons needing immediate treatment were ineligible for service since the program was restricted to those who could qualify for aid to the blind. This group included those found ineligible for aid to the blind through an eye examination, but who had eye conditions which if not treated would result in loss of vision. The state supervising ophthalmologist and the medical advisory group recommended inclusion of these cases in the treatment program. The recommendation was approved and provision made for funds. Treatment to restore and conserve vision could then be extended to persons eligible for some type of public assistance although not necessarily eligible by vision for aid to the blind.

The program advanced further when in 1943 medical eye care to conserve or restore vision was made available to any person in the state who was without adequate resources to provide the care himself, and again in 1945 when treatment of strabismus was included. More recently treatment of congenital cataracts has been added through an agreement with the Kansas Crippled

Children's Commission, heretofore the legally responsible agency for treatment of this eye condition.

The eye care program in Kansas continues to be state administered and financed with the participating ophthalmologists and county welfare departments carrying major responsibility for extending the services to the individual. The participating physicians are carefully selected. Their applications are received by the state supervising ophthalmologist and qualifications are reviewed by the conservation of eyesight committee. Upon recommendation the physicians are formally approved for participation. The 105 county welfare departments serve as intake points for the program and extend social casework services as needed. The cooperation and personal interest of the ophthalmologists and county welfare departments has been a major success factor.

Determining Eligibility

How can a person in Kansas receive service through the program? Anyone who believes he has an eye condition which can be helped by medical care may make application to the local county welfare department. He may or may not be receiving a public assistance grant. On receipt of the application the county department arranges for an examination by an eye physician selected by the applicant, one whose name is on the approved list of examiners. The examining ophthalmologist submits to the state supervising ophthalmologist a report of his examination on a prescribed form along with a request for authorization of specific services based on a uniform fee schedule and hospital costs used throughout the state. At the same time

the county welfare department determines financial eligibility if it has not already done so and submits a statement on this. A social data record is prepared by the county worker; one copy is sent to the examining physician and one to the medical social consultant. These reports are reviewed by the medical social consultant and state supervising ophthalmologist.

A factor fundamental to success is a careful review of all medical and social reports received and a prompt and complete interpretation to the county welfare department of their medical, social and vocational implications. Eye care should be integrated with other services such as social casework, educational adjustment and vocational counseling if it is to be a total service to the individual, a program for the future and one of rehabilitation.

The state supervising ophthalmologist after a review of reports and on approval issues authorizations to the various participants who will be assisting in the treatment plan. The county welfare department is notified and asked to assist. Barring complications, service is given, progress reports submitted on results of treatment, claims filed and direct payment is made to each participant.

Types of Treatment

At the present time in Kansas the types of treatment more frequently provided are surgery and glasses for the cataract patient; glaucoma treatment and surgery; glasses and surgery for crossed eyes and treatment for any condition wherein sight is endangered without care or may be improved by a medical service. The program does not cover care of general conditions in which the basic cause is outside the

eye itself. This need, when evidenced by the ophthalmic examination, is reported to the county welfare department with the request that medical care be made available. In general, eye care for simple refractive errors is referred to the county welfare department. This care is usually available locally through civic organizations and the public assistance programs.

A recent study revealed that 50.2 per cent of applicants referred during the year 1952 were 66 years of age or older and 49.8 per cent were 65 years of age or younger. During this period 347 individuals had care provided with the result that 69 had sufficient vision restored to remove them from the category of blindness; 147 were helped by surgery or treatment to maintain or improve their vision and only four lost vision in spite of treatment. Of this group of 347 individuals cataract surgery and glasses were provided to 41 per cent, glaucoma surgery and treatment to 28 per cent, strabismus care to 11 per cent and 20 per cent received care for various other conditions. The total cost of care extended to this group in 1952 was \$41,874.53, an average of \$165.81 per person.

Case Finding a Major Problem

Although the eye care program is broad in scope and financial eligibility requirements are sufficiently flexible so that no individual should be deprived on technicalities alone, we are aware that every person needing eye care has not secured it and possibly does not know how to secure it. A large number of referrals request financial aid from the public assistance agency, and often eye conditions are not recognized until vision is almost gone. Case finding is one of the major

problems. The professional staff of the division of services for the blind, although small, carries on activities of which case finding is an integral part. Some of these are:

1. Consultation services to county welfare departments on a continuous basis, designed to help administrator and staff strengthen and improve the agency's service which is extended by correspondence or direct visit, by case conferences, institute programs and workshops.

2. Leadership in close cooperation with the State Department of Education and State Board of Health to better equip teachers and nurses in case finding and a sight conservation program for children. For example, institute programs are planned for public health and school nurses through the state; talks are given at teachers' colleges and at the teachers' institutes which are held prior to the beginning of each school year.

3. County-wide surveys conducted by division staff members in close cooperation with the county welfare department in an effort to locate all persons with eye problems. An intensive public information program is a part of the survey via newspapers, radio and talks before local civic and professional organizations. This method not only uncovers unmet medical eye needs and blind individuals but serves to alert the community to the importance of prompt and early eye care.

4. Direct service, with vision screening programs, in communities without school health personnel. This includes help with organizing the program, general administration and follow-up.

The State Board of Health and State Department of Education look to the division for a consultation service to public health nurses and teachers in the area of vision screening and conservation of eyesight for school children.

5. Contacts with school officials, health agencies, the medical profession and community leaders in an effort to make better known and better understood the medical care program as well as other services of the division.

6. Public information activities to promote eye health and interpret the programs being carried on. Lecturers are made available to special groups, program material provided for civic organizations, exhibits held at conventions and meetings, illustrated leaflets and the division's monthly publication, *The Observer*, given wide distribution throughout the state.

7. On a demonstration basis special agreements between the division of services for the blind and a limited number of county departments of social welfare relative to incorporating services to the blind and to those with eye problems into its social welfare program. The division agrees to reimburse the county department of social welfare for expense of this service. Some interesting activities are being carried on in these areas. One special worker has assisted with vision screening in the rural schools, a program never heretofore undertaken in that particular county. A total of some 3,570 children were screened and of these some 355 were referred for eye examinations. It is too soon to measure results of this worth-while activity but early indications are that a number of visually handicapped children

were identified and are securing sight restorations. In one other county a worker has established a close relationship with the local township trustees as a method of case finding and program interpretation. This same worker is introducing the eye care program to local adult boarding and convalescent homes. In still another county the department of social welfare has been instrumental in developing vision screening as a part of supervised field work for students in the department of education of the local college. These students will conduct the screening program in the local public and parochial schools.

Results of the efforts at case finding and getting services to the individual are gratifying as we see demonstrated throughout the state more eye consciousness and a recognition of the need for eye care, more vision screening programs in schools and state institutions and more younger persons receiving needed care.

We see the task ahead as one to insure that the benefits of a fully developed program are available wherever the need exists. The case stories of Ann and Mr. A demonstrate what can be done with concerted effort.

GM SAVES EYES

Since 1947 every employee and every visitor at the Oldsmobile plant of General Motors Corporation has worn safety glasses at all times in all areas. During the past five years only two serious eye injuries have occurred, in both cases when the employees had violated instructions and removed their goggles. Eighty-six employees escaped serious eye injury during this period due to the protection worn.

An Historical View of the Education of Partially Seeing Children

WINIFRED HATHAWAY

Former Associate Director
National Society for the Prevention of Blindness

Forty years ago, when many schoolrooms were lighted by flickering gas jets, the first class in the United States for children with serious eye difficulties was started in a little Massachusetts school. How such special educational facilities were developed and improved as the years advanced is told by Mrs. Hathaway, who for more than 25 years has been a leader and widely recognized authority in this field.*

IT was the month of April 1913; to be exact, it was the third day of that month of promise, of sunshine, and of those beneficent spring showers that prepare the good earth for the seeding. Surely there could not have been a more propitious month for undertaking a new venture; a venture with the promise of bringing sunshine to many through the life-giving showers of care, understanding and welcome educational opportunities.

The inhabitants of Thornton Street in the Dillaway district of Roxbury, Massachusetts, were all agog with curiosity to know whatever was happening to the little old Thornton Street schoolhouse that had been abandoned some time before, when the children had been moved from the dilapidated structure to a school across the street. Recently the barriers at doors and windows of the old school building had been removed; new panes of glass had been put in broken win-

dows and a part of the building made fairly habitable. Someone, perhaps a teacher, had gone in when the workmen had finished, and had arranged the small amount of rather strange-looking furniture that had been delivered.

On this third day of April the curiosity of the neighbors increased, for six children appeared with a teacher and entered the building. They looked no different from other children. To be sure, some wore glasses, but so did many children in the school across the street.

Through that intangible means of communication known as the grapevine, the neighbors learned that the teacher was a Miss Helen Smith, who had been teaching in Perkins Institution and Massachusetts School for the Blind. Evidently the six children were not blind, so did not belong there. However, it was understood that they had serious eye difficulties which prevented them from seeing well enough to attend that school across the street. Some plan of education suited to their

* A paper presented at the Annual Conference of the National Society for the Prevention of Blindness, New York, March 1953.

needs was to be tried out in this little old Thornton Street school.

First Steps

While the neighbors were wondering about it, the teacher inside the building was having no easy time. The old French proverb, "It is the first step that costs," must have been in her mind in undertaking this new venture for she had carefully planned this first day. The children were to have an opportunity to become acquainted with one another and with their new surroundings; they were to find the seats that would be most comfortable, and then each was to choose something to make. But alas! The materials Miss Smith had so carefully planned and ordered had not arrived! Being a most resourceful teacher, however, she began by telling an interesting story, and had the children act out the parts. Games were played, interspersed with some arithmetic based on the children's experiences. The luncheon period offered opportunity for getting better acquainted, and then even a little reading was tried from the few books Miss Smith had been able to find with print large enough for the children to see. And so the hands of the clock moved toward closing time, and the preparations for getting the children back to their homes. Thus ended the first day of a venture that was to have widespread significance throughout the United States of America.

The London Program

The prologue for the little drama enacted in the old Thornton Street school on that day of April had been written in Great Britain. It was at the beginning of the twentieth century

that Dr. James Kerr, the first medical director of the London School Board—later the London County Council—initiated a school health program. He called upon a number of young clinical assistants at Moorfields and other London hospitals to make a study of the vision of the school children of that city. He gave them directions to test the eyes of the children for visual acuity, note any sign of difficulty, record their findings and arrange for thorough eye examinations and follow-up in cases in which preliminary findings indicated the need.

One of these assistants, Mr. N. Bishop Harman,* was appointed to have charge of the ophthalmological service of the schools for the blind in London. He found that many of the children in these schools were not blind, but had been placed there because of high myopia.

Dr. Kerr requested that these findings be presented at the Second International Congress of School Hygiene held in London in 1907. In this report Mr. Harman emphasized the fact that since these myopic children were not blind, they should not be sent to an institution for the blind, but should, rather, be provided with special educational facilities suited to their needs, and have contact with the seeing world.

Miss Nettie Adler, chairman of the session at which this report was given, was a member of the Educational Committee of the London County Council. She presented to that body a project formulated by Dr. Kerr and Mr. Harman for the education of these myopic children. The members ap-

* In Great Britain ophthalmologists use the term Mr. rather than Dr.

proved the plan and no time was lost in putting it into action. Mr. Harman was charged with carrying out the experiment with the aid of two teachers.

A little one-story building in Camberwell, South London, was selected and there, in 1908, was established the first school or class in the world especially for the education of partially seeing children. At first all reading and writing were prohibited, as indicated by a legend over the door: "Reading and Writing Shall Not Enter Here!" After a little experience, however, changes were made; some manuscript writing in large letters was introduced and some reading from material printed on big sheets of paper with rubber-stamp letters of considerable size. But emphasis was still laid on oral and handwork. The little schoolhouse selected was on the playground of a large elementary school in which much oral work was encouraged. Since Mr. Harman had emphasized the fact that these myopic children should not be segregated, they participated with the normally seeing in as much of the program as was considered advisable. Great care was taken to see that they did not engage in any games or exercises that might be harmful to their vision.

On the European continent the need had been felt for the same type of special educational facilities. In 1911 a class was established in Strasbourg. It differed from the London group in that not only myopic children but those with other serious eye difficulties were included.

Developments in Boston

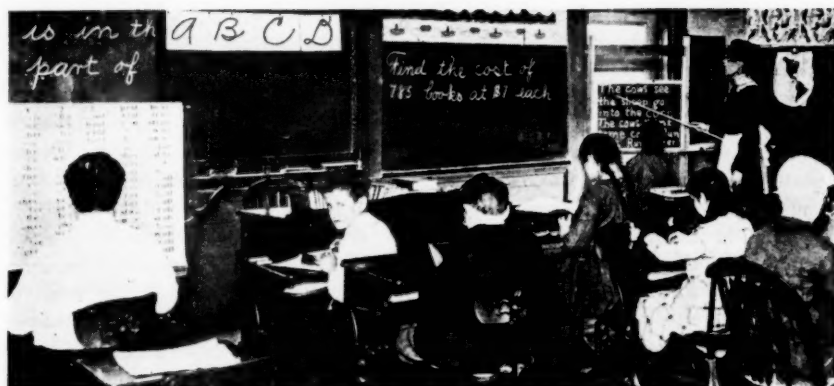
In 1909 Dr. Edward E. Allen went to Europe to study the work being done in schools for the blind. As a

teacher and later as director of Perkins Institution and Massachusetts School for the Blind, he experienced difficulties because of the partially seeing children placed in these schools. He, in common with other administrators, felt that the educational materials and other equipment provided for the blind were unsuitable for seeing children and that psychological reactions resulting from such placement were often unfavorable.

In London Dr. Allen learned of the special arrangements made for myopic children and judged that such procedures might solve some of the problems in America. He realized that many changes would be necessary, that special educational facilities should be provided not only for myopes, but for all children with serious visual difficulties, as was later demonstrated in the Strasbourg class. On his return to the United States, he interested the people concerned with these problems, and urged the Board of Education of Boston to provide such opportunities. But new ideas often take considerable time to be converted into action, and it was not until that third day of April in 1913 that an opportunity was made available in Thornton Street school.

The Cleveland Plan

For some time administrators and directors of state and local departments of education in other parts of the country had been seeking solutions to the problems of educating partially seeing children. Early in the twentieth century classes for blind children had been established in the public school systems of several cities, notably Chicago, Cleveland, Milwaukee and New York. In Cleveland, Robert B. Irwin, himself blind, had worked out a



The first class established in the U. S. especially for partially seeing pupils; Boston, 1913

cooperative plan by which the blind children undertook all work requiring special teaching and equipment in these classes, and participated with the normally seeing children for oral work and other activities as considered advisable. Some administrators, in attempting to solve the problem of educating the partially seeing, placed them in these classes for the blind. But, as in the London experience, it was an unsuccessful arrangement.

In 1913, Dr. Irwin requested that the two groups be separated and that educational facilities suited to the needs of the partially seeing be provided. In September of that year such a plan was established in the Waverly School in Cleveland, Ohio, the second class in the United States specifically for the education of the partially seeing. Dr. Irwin arranged for this group the same cooperative system that he had demonstrated as feasible for blind children.

Thus in 1913 were established two types of classes: one a segregated grouping by which the partially seeing carried on all their school activities in the special class; the other, a coopera-

tive plan by which these children did all work requiring close use of the eyes in the special class but participated with their normally seeing companions in all other activities considered advisable for them. The first class was a great advance since it provided educational opportunities suited to their need for children who had, theretofore, received little if any attention. It had the drawback, however, of separating these children from their normally seeing companions for all their school activities, thus designating them a special group.

The second class marked a decided step forward, since it provided the necessary educational facilities for the partially seeing and at the same time afforded opportunity for contact with the normally seeing, thus stressing their abilities, rather than emphasizing their limitations.

As other states and cities undertook to provide special educational opportunities for their partially seeing children, a minority followed the plan of segregation; the majority that of cooperation.

Upon embarking on this new educa-

tional venture, administrators were faced with many and varied problems. Answers must be found to important questions, such as: What children require special educational facilities because of serious eye conditions? How shall these children be discovered in the school system? What special educational facilities must be provided in order that they may develop these abilities to the fullest extent?

After careful consideration it was decided that the following come within the category of the partially seeing: Those who have a distance visual acuity of 20/70 or less in the better eye after the best possible correction and who can still use sight as their chief channel of learning; and those who, in the opinion of the eye specialist, can benefit from either temporary or permanent use of appropriate special facilities.

Answers to the second question, that of finding partially seeing children in school systems, differed according to the procedures for medical inspection and follow-up. In a few instances, in states requiring medical examination of all children, the records made it possible to identify those needing special educational facilities. Elsewhere it was found necessary to provide for visual acuity tests with the follow-up of all children reported as having visual deviations from the accepted norm. The type of test to be used and the personnel by whom such tests should be given had to be decided by the medical and educational authorities of the community concerned.

The proportion of school children to be provided for presented another problem. Accepted surveys indicated that one child in four showed some

visual deviation, but that the great majority of these children could be so cared for medically and optically that they were not in need of special educational facilities; that only one child in approximately 500 of the school population came within the classification of the partially seeing in need of special educational opportunities.

Taking these findings into account, administrators realized that even in large cities special facilities would not be needed in every school. To avoid difficulties of transportation, centrally located schools must be selected and opportunities offered there to those in surrounding areas, transportation costs being met by the educational authorities.

Lighting and Equipment

It is difficult for the younger generation to visualize the lighting conditions of schools even in the second decade of the twentieth century. In the older buildings little attention had been given to adequate glass area and placement of windows. Many classrooms of this period had a glimmer of artificial illumination from fixtures suspended from the center of the ceiling by four arms, each equipped with a flickering gas jet. Even this feeble lighting lost some of its very doubtful efficiency because of the exceedingly low reflection factors of the dark brown or dark green walls then in vogue, together with dark ceilings and floors, all with glossy surfaces causing a most distressing glare. Even later, when electricity came into general school use, lighting codes stressed a minimum of five foot-candles. It was a considerable time before these codes moved to higher minimums and the dark walls gave place to pastel colors, with white

ceilings and light-colored floors, all in dull finish to prevent glare. It was longer still before dark brown desks were replaced by those in light colors to insure better reflection factors and to lessen the contrast between the desk and the white paper used on it.

Some of these changes resulted, in part at least, from the innovations that had to be made in classrooms for the partially seeing if they were to be able to do the necessary eye work required in reading, writing, arithmetic, etc. Hence, these classes came to have a double responsibility—that of providing the necessary equipment and facilities for the partially seeing, and of serving as an example of eye hygiene for the normally seeing.

In the early days the only writing done in these special classes was on chalkboards, usually individual boards on the under surface of the desk top and raised when needed. The only reading was from material printed with rubber-stamp letters of considerable size on large sheets of paper. These were bound into bulky books, difficult to handle and to care for.

Large-Type Books

It was indeed a welcome suggestion, reportedly from a teacher in one of the Cleveland schools, that possibly books might be printed in type sufficiently large and legible for use by the partially seeing. Dr. Irwin lost no time in following up this suggestion and appointed a committee to select texts. At that time the Aldine and Elson readers were in general use in school systems and as an experiment some of these were printed in 36-point type, set by hand. They proved to be such an advantage over the earlier material that they were eagerly accepted. Because

the large print limited the page content, and the very black ink used for contrast made only one side of the page usable, a later experiment was tried with 24-point type printed in much lighter ink, so that both sides of the paper could be used. This, too, proved to be a considerable advance.

Another innovation affected the size of type. In order to lessen the eye load for the partially seeing it was decided to teach the touch system of type-writing. However, the only typewriters available in large type letters were the commercial bulletin machines with all capital letters—considered unpedagogic for school use. The question of producing machines in 24-point type, with upper and lower case, was taken up with the manufacturers who, though most cooperative, found it impractical to produce machines with letters larger than approximately 18-point type. When these were tried the majority of the older pupils who had mastered the mechanics of reading found the 18-point met their needs. Hence, although elementary school books continued to be printed in 24-point type, some of the older pupils used the 18-point. Because of the expense of producing these books, and the difficulty of getting permission from the publishers of the original texts to reproduce them in the desired type, also because of the very wide range of books used in the various school systems, there has always been a shortage of material. Consequently, many mechanical devices, such as the talking book and recording machines, have come into general use. These devices broaden the opportunity for acquiring information without too much close use of the eyes.

There were accomplishments along other lines. Since the partially seeing

could discern little on the ordinary school maps, several companies issuing these were cooperative in following suggestions made for simplifying them. Hundreds of names in small print were removed (a great boon to all children); heavier outlines and strong contrasting colors for boundaries were used. Teachers often found it expedient to make their own maps of clay or plasticene so that terrain might be more easily discerned.

Preparation of Teachers

In these early days teachers had no opportunity of preparing for their special work with partially seeing children. Each had to solve problems through the trial and error method, thus to a certain extent experimenting with children who had difficulties enough of their own to meet. Individuals and organizations interested in this new venture in education, realizing the waste of time and energy thus consumed, began to consider the best way of meeting the need. Through the efforts of many, a first course for the preparation of teachers in this field was given at the 1922 summer session of Teachers College, Columbia University. Dr. Irwin acted as administrator of the course, which was conducted by one of the Cleveland teachers with the aid of experts in the various phases of the work. A small demonstration class of children was in session for a short period each day. Thus a beginning was made, naturally experimental in nature, as were similar courses given on request at Peabody College in the following summer sessions. It soon became evident that a much more intensive, comprehensive course was necessary if teachers were to be adequately prepared.

Basic Course Requirements

On request, the National Society for the Prevention of Blindness prepared the following schedule of minimum basic requirements:

1. Thirty clock hours of lectures and discussions on the organization and administration of special educational facilities for the partially seeing and physical equipment of classrooms.
2. Thirty clock hours of lectures and discussions on the best methods of conducting such work in elementary, junior high and senior high schools; educational media and their correct use, and vocational guidance.
3. Thirty clock hours of observation and participation in a well conducted demonstration class.
4. Thirty clock hours of medical lectures on the anatomy, physiology and hygiene of the eye; principles of refraction, refractive errors, eye diseases and systemic diseases affecting vision, together with observations and discussions of cases presented in an eye clinic.
5. Individual and group conferences.

The University of Cincinnati, in cooperation with the National Society, offered such a course at its 1925 summer session. Miss Estella Lawes, supervisor of the classes for the partially seeing of Cincinnati, together with a National Society staff member, planned the course and conducted the administrative and educational work. Dr. Donald Lyle gave the medical lectures and held eye clinics for the students at which they observed the cases presented. Miss Lawes arranged for an adequate demonstration classroom in charge of a Cincinnati teacher of the partially seeing, where those



A present day classroom with high level lighting

taking the course observed and participated in some teaching. They also had the benefit of conferences with the teacher of the class, and with the directors. This Cincinnati project formed the basis of future courses given in various parts of the United States.

The first refresher course for teachers who wanted to be brought up to date on medical and educational advances was conducted at the University of Chicago by the same administrative and educational directors as gave the University of Cincinnati course. The medical lectures were planned and given by Dr. E. V. L. Brown, a noted ophthalmologist of Chicago, with several ophthalmolo-

gists assisting. Such courses were at first signified as advanced. Later, workshops for supervisors and teachers of the partially seeing were instituted.

By the 1940's, 640 special classes for the partially seeing had been established in 35 states, the District of Columbia, the Territory of Hawaii, representing 221 cities and counties, with some assistance given to a very small number of children in rural districts. In general, these classes were under the direction of state departments of special education in cooperation with local departments of education. State, city, and county educational administrations and supervisors

were responsible for establishing classes and giving the necessary assistance to communities under their jurisdiction. As indicated, these facilities were chiefly available in the larger cities. In some states, the closing of one-room rural schools and the building of consolidated schools to serve several districts offered opportunities to establish facilities for the partially seeing.

Give Them Light!

It is customary, when an important building is to be erected to lay, with "pomp and circumstance," a cornerstone of the foundation and to place securely therewith some message for posterity to discover. In that little Thornton Street school on that third day of April, 1913, neither pomp nor circumstance marked the laying of the cornerstone of a foundation on which others were to build; no message was sealed away for some future generation, but rather a living message went forth for all to read:

Time gives a perspective to history.
Learn from our experiences.
Avoid our mistakes.
Build on our successes.
Above all, keep an open mind, for
progress means change.

Remember the words of Phillips Brooks: "The world marches forward on the feet of its children." Give them light, that they may see the way!

SCHOOL LIGHTING ISSUE

A valuable School Lighting issue of *Illuminating Engineering* appeared in June 1953. The journal is published by the Illuminating Engineering Society, 1860 Broadway, New York 23.

SAFETY COUNCIL TESTS DRIVERS

A driver testing clinic and safety exposition was sponsored last summer by the Greater New York Safety Council. Held in the concourse of the 42nd Street station of the Eighth Avenue IND Subway and in the Baltimore and Ohio Railway Terminal, it offered the public an opportunity to take stock of driving abilities and to receive advice on correction of deficiencies.

The Council reports that of the 8,000 motorists who took the free tests nearly 20 per cent were found to have vision deficiency that made them unsafe drivers. Most of those who failed this test were surprised to learn of their eye conditions. Many believed their sight was good because they wore glasses, failing to realize that changes in the correction might be necessary over a period of years.

The vision of one motorist who had been driving for many years was found to be below the state's minimum requirement of 20/40 for a driver's license. This man immediately went to his eye specialist, secured a new prescription, came back the same day with the new lenses, and passed all the tests.

Another hazard to safe driving of which many of those who were tested seemed unaware was the slowing of their reflexes. Many who failed the reaction-time test admitted they had had no idea they had "slowed up" with the years. Such slowing of reflexes is normal but drivers must be made aware of it so they can allow for it in their driving.

Additional clinics are tentatively planned for later this year.

The Sight-Saving Review

Eyes and Heredity

"DISORDERS which impair vision are considerably more numerous than those confined to the eye," said Marshall M. Parks, M.D., of Washington, D. C.,* in his talk, "Impaired Vision and Its Inheritance," at a spring meeting of the National Catholic Education Association in Atlantic City, New Jersey. Dr. Parks represented NSPB at this meeting. Congenital defects, degenerations and cancers, said Dr. Parks, directly damage, while vascular and metabolic diseases indirectly damage the visual apparatus. All these disorders, he pointed out, are hereditary to a limited degree and are transmitted as dominant, recessive, or sex-linked patterns.

In dominant inheritance the disorder must be present in a parent. The parent transmits the disorder to about 50 per cent of his or her children. The affected children again transmit the disorder in the next generation to about 50 per cent of their offspring, and so on. The unaffected children are not capable of transmitting the disorder.

In recessive inheritance the disorder in the afflicted child is usually not manifest in either parent; however, each parent possesses a tendency toward the disorder. Each parent having a weakness for an identical defect transmits the defect in the manifest form to about 25 per cent of his or her children. Blood relatives are most apt to have tendencies toward identical defects; consequently, this is the type

of inheritance that plagues consanguinity. Dr. Parks cited the case of parents who were second cousins. Two of their six children were albinos. Both parents were free of albinism and there was no history of albinism in their families.

Sex-linked inheritance is manifest in about one half the males in successive generations or in every other generation. The disorder of an afflicted child is not manifest in either parent, yet the mother transmits it. This type mother is called a carrier. About 50 per cent of her sons manifest the disorder, and about 50 per cent of her daughters become carriers. The afflicted father transmits the disorder to 50 per cent of his daughters in the carrier state and to none of his sons. The normal sons and normal daughters will not transmit the disorder. One of the commonest sex-linked visual disturbances is color blindness, which is found chiefly in males.

Some congenital defects which were originally believed to be hereditary are proving not to be. The following three disorders which together account for a vast percentage of visual impairment in preschool children are examples: congenital cataracts, which may result from German measles in the mother during the first three months of pregnancy; congenital toxoplasmosis, a parasitic disease; and retrolental fibroplasia, a complication resulting from premature birth, and the greatest single cause of blindness in preschool children.

Among the hereditary congenital visual defects are included some types of cataracts, aniridia, farsightedness, nearsightedness, astigmatism, stra-

* Associate Staff, Children's Hospital; Junior Surgeon, Episcopal Eye, Ear and Throat Hospital; Pediatric Ophthalmologist, Georgetown University Hospital.

bismus, nystagmus, and coloboma of the optic nerve. The degenerations include such examples as retinitis pigmentosa, hereditodegeneration of the macula and multiple sclerosis. The latter affects various pathways throughout the nervous system, including the optic nerve and pathways.

Cancer represents a group of disorders which impair vision; this is unique in that the cancer first appears in the individual sporadically, having no hereditary quality. However, once the condition has sporadically appeared, it is capable of being transmitted by hereditary means. Two cancers which primarily occur within the eye are retinoblastoma and malignant melanoma.

Vascular diseases affect the blood vessels throughout the entire body and ultimately interfere with the nutrition of the tissues supplied by the blood vessels. Degeneration of the blood vessels can be inherited, indirectly damaging the retina and impairing vision.

An excellent example of an hereditary metabolic disease is diabetes. Dr. Parks pointed out that the retina is highly vulnerable to this disease. Diabetes also may damage the lens, causing cataracts. Disturbances in the fat metabolism throughout the body may cause visual impairment. Amaurotic familial idiocy is an hereditary fat metabolic disease which destroys vision.

Dr. Parks concluded his talk with a reminder that when parents ask whether additional children will inherit the disorder and whether afflicted children will transmit it, current concepts as to what disorder is and what disorder is not hereditary cannot be considered as absolute.

J. E. NICHOLS JOINS NSPB BOARD

J. E. Nichols, director of industrial safety for Reynolds Metals Company, has accepted election to the board of directors of the National Society for the Prevention of Blindness. In making this announcement Mason H. Bigelow, president, reported that the Society's rapidly growing campaign to prevent industrial eye accidents has earned the enthusiastic support of top business and labor leaders.

"The appointment of Mr. Nichols—a man with vast experience in the field of industrial safety—to the Society's board is an important step forward in the organized effort to reduce tragic industrial eye accidents," he said.

Mr. Bigelow emphasized that the general public has a direct stake in industrial safety. "During 1953 alone, an estimated 300,000 working men and women will suffer eye injuries," he said, "despite the fact that more than 95 per cent could be prevented." These injuries mean an enormous reduction in earning and purchasing power, as well as great loss due to compensation and medical costs. And even more important, the loss in human happiness and welfare can never be calculated.

Mr. Bigelow further reported that the Wise Owl Club of America, sponsored by the Society and composed exclusively of men and women who saved themselves from blindness by wearing eye protection on the job, now has chapters in 773 plants, reaching 1,036,576 employees and 4,510 members. Among these members 6,548 eyes have been saved. All states as well as Hawaii and Canada are represented in the club membership.

Progress in Ophthalmology

"FROM the remotest times man has been keenly interested in the eye and its diseases," said Dr. Derrick Vail in a recent address before the First Western Hemisphere Conference of the World Medical Association held in Richmond, Virginia. "The individual having special knowledge and skill in the treatment of ocular disease has always been an honored member of society. In the famous 'Code of Hammurabi,' established about 2000 B.C., the eye was valued as much as life itself for the surgeon received the same fee for saving an eye as for the saving of a life and also the same penalty (cutting off his fingers) for failure to do either."

Dr. Vail, who is professor and head of the department of ophthalmology, Northwestern University Medical School, said that in the 1850's Donders, Bowman, von Helmholtz and von Graefe, four scientists of great genius living in Europe, founded the modern science of ophthalmology. As the result of their work and that of their immediate followers, the ophthalmologist of 1878, particularly in Europe, had most of the basic facts and many of the essential bits of special apparatus and equipment that are used today. He shared with general medicine and surgery the increasing amount of knowledge that has rapidly accumulated since then.

The subsequent seventy-five years have shown a consolidation, additions

to and refinement of the basic knowledge pertaining to ophthalmology available in 1878. Even today in the fields of basic subjects pertaining to the eye such as anatomy, physiology, pathology, embryology and so on, discoveries are being made. Ophthalmology has been quick to seize, to the advantage of its patients, discoveries in all scientific fields that are pertinent. The necessary instruments for proper examination are now precision made, possess greater magnification and higher illumination than ever before and permit most accurate examination of the exterior and interior of the eye.

"With the advent of the wonder drugs such as the sulfa preparations and the antibiotics," continued Dr. Vail, "ophthalmic infections took a severe beating. Before this time ophthalmia neonatorum or infected eyes of the newborn was a most dreadful and expensive disease to treat, often requiring more than a month of skillful, gentle treatment around the clock by trained nurses. With the use of the sulfonamides the disease was cured in a matter of hours, and with penicillin in a matter of minutes."

Modern ophthalmic surgery, he pointed out, has become quite precise and safe, so that the percentage of successful surgery for cataract, glaucoma, detached retina, corneal transplantation and strabismus is an exceedingly high one, higher than ever before. ACTH and cortisone have

proven in a very short time to be of the greatest value in ophthalmic diseases, especially those that are allergic or inflammatory in nature.

However, blindness due to the non-infectious systemic diseases such as diabetes, kidney diseases, arteriosclerosis and other metabolic diseases so prevalent in the aged has increased as the life span of our people is prolonged. These conditions offer a great challenge to modern ophthalmology. Retrolental fibroplasia, unknown before 1942, and now becoming the major cause of blindness in children, continues to be a baffling disease insofar as prevention, etiology and treatment are concerned.

One can say with some confidence, having surveyed the advances in ophthalmology in the last seventy-five years, Dr. Vail concluded, that there is little or no excuse for blindness, anywhere in the world, due to trachoma, ophthalmia neonatorum, most other ocular infections, cataract, detached retina, nutritional diseases and even glaucoma, if only the facts that are now known about the treatment and care of those conditions can be put into effect.

FAITH HEALERS' CONVICTION UPHELD

The *Journal of the American Medical Association* recently reported that the conviction of William and Dora Estep, faith healers and incorporators of the National Institute of Orthoptics of Chicago, has been affirmed by the appellate court of Illinois. This institute was incorporated in 1947 to train "psychophysicians." The court of appeals stated that the defendants were guilty of conspiring to violate the medical practice act of Illinois. (People vs. Estep et ux., 104 N.E. [2d] 562 Illinois 1953; JAMA, May 2, 1953)

NATIONWIDE OBSERVANCE OF SIGHT-SAVING MONTH

"Will Blindness Strike your Home" was the theme of the National Society's annual observance of September as Sight-Saving Month. This nation-wide educational campaign focuses attention on the need for intensified research into the causes of the blinding eye diseases, and alerts individuals to the symptoms of possible eye trouble.

All major elements of the mass communications media were enlisted in the program. State committees of NSPB and scores of prevention of blindness agencies throughout the country undertook local campaigns.

Governors of 27 states officially designated September as Sight-Saving Month. Transit companies in 52 leading cities agreed to display the National Society's 1953 car card in the more than 17,000 vehicles which carry their passengers. With the help of the Advertising Council the nation's more than 2,500 radio and television stations were invited to participate by contributing free public service time for live and transcribed announcements.

Newspapers in all 48 states, as well as 2,000 magazines of general and special circulation, were furnished educational material in the form of news, feature stories and editorials for use during September. The extensive radio phase of the project was developed under the volunteer chairmanship of Jack Berch, ABC-Prudential radio star.

The immediate response of the public to this nation-wide campaign has been most gratifying. NSPB has already received thousands of requests for information on eye health.

FEDERAL GRANTS-IN-AID for Health, Education and Welfare

BECAUSE of current Congressional interest in federal-state relationships in many fields affecting sight conservation programs, there follows a summary of funds available from the federal Department of Health, Education and Welfare, exclusive of federal funds for research.

Federal grants to states began in 1862 when public lands or land scrip were given for maintenance of colleges teaching agriculture and the mechanical arts. Subsequent acts have developed and enlarged financial participation. In 1950 federal funds accounted for 10 per cent of all state-local revenues.

U. S. Office of Education

Average annual grants for past 3 years totaled \$181,000,000, representing about 10 per cent of all funds expended for assisted programs.

U. S. Public Health Service

1953 appropriation:

Venereal disease control	\$9,800,000
Tuberculosis	8,240,000
General health	13,000,000
Mental health	3,000,000
Cancer control	3,050,000
Heart disease control	1,500,000
Hospital construction	75,000,000

Total grants-in-aid for state and local programs \$113,590,000
(Research grants not included in above)

Office of Vocational Rehabilitation

1953 appropriation, \$22,250,000. Federal share of total expenditures for vocational rehabilitation programs in 1952 was 67.7 per cent; state share, 32.3 per cent.

Childrens Bureau

1953 appropriation:

Maternal and child health . . .	\$12,746,579
Crippled children	11,482,498
Child welfare	4,370,923
Total	\$28,600,000

Bureau of Public Assistance

Total 1953 estimated expenditure, \$1,360,000,000.

Old age assistance, \$921,219,000, approximately 53 per cent of all payments. State funds meet 41 per cent and local funds 6 per cent. Federal share ranges from 32 per cent in Connecticut to 74 per cent in Mississippi.

Aid to dependent children, \$345,967,000, about 52 per cent of all payments.

Aid to permanently and totally disabled, \$58,879,000, about 49 per cent of cost of program.

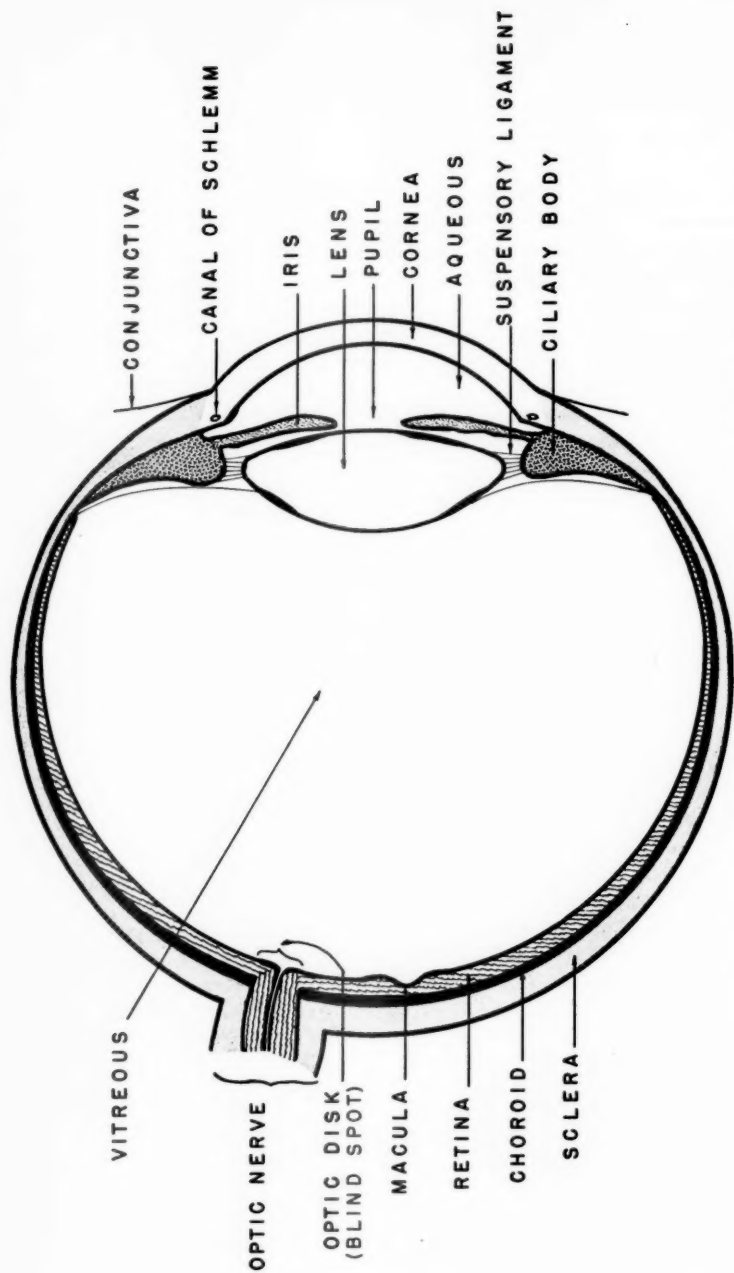
Aid to the blind, \$33,935,000. Federal funds pay about 47 per cent of the cost, state funds 46 per cent and local funds 7 per cent.

BUTLER CLINIC

The Butler Sight Conservation Clinic, organized and operated by the Butler County Optometric Forum with the Butler Branch of the Pennsylvania Association for the Blind, recently celebrated its first anniversary. The clinic, originally held every second or third week, and now being conducted weekly, provides eye examinations to needy clients referred by community health and social agencies. Members of the Butler County Optometric Forum contribute their services in visual screening and refraction. A total of 226 patients have been admitted to the clinic in its first year of operation.

Cases requiring more detailed examinations, as well as medical and ophthalmologic treatment are referred to local physicians and the Falk Eye Clinic in Pittsburgh.

HORIZONTAL SECTION OF A RIGHT EYEBALL



In response to many requests from schools and colleges NSP8 now includes in its list of publications this diagram of a right eyeball. No. 169, size 8½" x 11", price \$1.60 per hundred.

NOTES AND COMMENT

• Frankford Arsenal Program

The industrial medical program of the Frankford Arsenal includes the Snellen and extreme near vision to blurring tests for visual acuity, ophthalmoscopic examination, and the issue of prescription goggles. In a recent article in the *Military Surgeon* it is stated that in 29.2 per cent of the employees examined uncorrected refractive errors or need for changing glasses were found.

Ocular disease including glaucoma, optic atrophy, thrombus of the central retinal vein, choroiditis, incipient cataract, and keratoconus were present in eight per cent. Of these, only 11 per cent were aware of their condition. Extraocular muscle difficulties were present in 18 per cent of the employees, and 1.26 per cent were color blind.

The correction of vision in the small arms and instrument manufacture departments has resulted in less fatigue and more and better work. The early treatment of diabetes lessens the possibility of complications such as cataract.

• Prevention Pays

North Carolina's School Health Coordinating Service conducts its comprehensive program on the sound premise that it is cheaper to prevent ill health and physical defects than to pay for cure and correction. A report in the June 1953 *Health Bulletin*, published by the North Carolina State

Board of Health, enumerates the activities of the service for the year ending June 1952. The total expenditures for that period amounted to \$520,988. Reports from school superintendents show that 19,799 medical examinations, 3,220 eye examinations, and 19,203 corrections of physical defects were given to children whose parents could not afford to pay. Among the corrections, 19 eye operations were performed, and 2,653 pairs of glasses fitted.

• Dr. Hart in Public Health Post

Dr. William M. Hart, assistant professor of ophthalmology at Jefferson Medical College, Philadelphia, has been named chief of the Ophthalmology Clinics of the National Institute of Neurological Disease and Blindness, Public Health Service.

• Interprofessional Committee

Two meetings have been held by the newly formed Iowa Interprofessional Committee on Eye Care, which consists of three physicians, three optometrists, two representatives of retail opticians, and two representatives of wholesale opticians. Alson E. Braley, M.D., is chairman of the group and Carl O. Lofgren is secretary.

The objectives of the committee are full deliberation of all facets of relationship between the professional groups of ophthalmology, optometry and opticianry, so that any and all practices

which can detract from or impair the quality of eye care to the public will be eliminated. Everything feasible will be done to provide optimum eye care for the public through encouragement of interprofessional relationships. The sphere of activity of this group must be limited for the present to the making of recommendations to the parent groups. The committee is supported by the Iowa Academy of Ophthalmology and Otolaryngology, the Iowa Optometric Society, and the opticians.

• Registration of Blind Persons

In a recent letter to the editor of *New York Medicine*, Dr. Raymond E. Meek called attention to the mandatory reporting of blindness in New York State. All social and health agencies and all physicians and nurses are required by law to report in writing the name, age, and residence of all blind persons and furnish information requested by the New York State Commission for the Blind for registration or prevention of blindness. Legal blindness is defined as visual acuity of 20/200 or less in the better eye, or loss of vision due to impairment of the visual field. Reporting blanks may be obtained from the New York State Commission for the Blind, 205 East 42nd Street, New York 17, New York.

• Hazard of Insecticides

Organic phosphates in newly developed insecticides have been known to cause serious visual impairment. Such toxic effects on the eyes of pilots are sometimes responsible for crashes of crop-dusting airplanes. The degree of exposure to some of these materials can be determined by a cholinesterase test. The Environmental Research Laboratory at E-306 Health Sciences

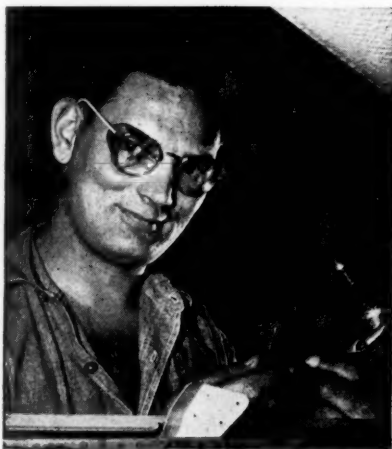
Building, University of Washington, Seattle, performs this test and supplies the necessary capillary tubes and shipping packages. The fee is \$7.50.

• Welder's Protection

Thanks to a welding cart which carries its own fire protection—a flame resistant curtain—the Akron Standard Mold Company has eliminated eye flash injuries in open maintenance weldings. A year ago there were five such accidents; in the past five months there was not one. The cart was designed and built at the plant by Fred Hallbrook, a production welder.

• Navy Boxing

The use of protective headgear is urged as a necessary precaution in training for boxing matches, in an article appearing in the May-June issue of the *Medical Technicians Bulletin* of the U. S. Armed Forces Medi-



Damage to safety spectacles leaves no doubt that William F. Reynolds, Jr., aircraft assembler at the Los Angeles plant of North American Aviation, Inc., is well qualified to join the Wise Owl Club. Mr. Reynolds holds the broken drill that struck the lens.

cal Journal. By immediately stopping a bout when cuts around the eyes are received, the authors state, more serious eye injuries are avoidable. Although Monsel's solution is effective in stopping bleeding, its use for eye cuts between rounds is considered dangerous.

It is pointed out that infractions such as heeling (raking laced section of a glove across the eyes) and back-handing, if not halted by supervisors, result in injury to the eyes. For a safe boxing program the authors suggest that neurologic and ophthalmoscopic examinations be included in the physical examinations administered before a contest; all contests and training should be supervised and a medically trained person should be present.

• Heed Fellowship

Dr. Bernard J. Mausheim of Fort Madison, Iowa, is the recipient of the Heed Fellowship in Ophthalmology at the State University of Iowa for his work on glaucoma. He will be able to make a two-month visit at each of three eye clinics of his choice.

• Proctor Medal

Dr. Kenneth C. Swan, head of the department of ophthalmology at the University of Oregon Medical School, Portland, was awarded the Proctor Medal at the June 1953 annual meeting of the Association for Research in Ophthalmology in New York. Dr. Swan, the fourth recipient of the medal, has done research for the past 20 years on drugs and their effect on ocular diseases, the basic physiology of eye movement and coordination abnormalities, and the causes and prevention of blindness. As part of a

state-wide program for ophthalmologic care and prevention of blindness, Dr. Swan and Dr. Leonard Christensen are conducting a three-year survey on causes of blindness. Their work is aided by a grant from the Kellogg Foundation.

• Eye Bank of Pittsburgh

Any person in Western Pennsylvania, regardless of circumstances, who needs eye transplant surgery may have the benefit of the operation at the Eye Bank of Pittsburgh, a new department in the city's Eye and Ear Hospital. A grant from the McClintic Endowment has made this development possible. Most of the hospitals in Western Pennsylvania are affiliating with the project.

Officials of the Eye Bank point out that its continuing success depends upon the interest, cooperation and generosity of the people in the community. The procedure for donating eyes is simple, but the time element is of utmost importance, since cooperating oculists feel that the eye tissue should be transferred within 24 hours after donation.

Interested persons wishing to cooperate may obtain the necessary information by writing to the Eye Bank of Pittsburgh, 230 Lothrop Street, Pittsburgh 13.

• Virginia Commission's Report

"It is less expensive and far more desirable to prevent blindness than it is to rehabilitate the blind." This principle has been maintained by the Virginia Commission for the Blind since its beginning and has been a moving force in its Sight-Saving Department, states the Commission's

annual report for the year ended June 30, 1952. Educational facilities for the partially seeing provided in Richmond, Roanoke, Norfolk and Arlington County are tangible evidence of the sight-saving work, but, the report emphasizes, the entire program should include every child of school age in Virginia. By working with the health departments, the program aims to have each child given an eye examination at the beginning of his school life, and as often as feasible thereafter. Vital to this endeavor is the follow-up of eye examinations which entails home visits to acquaint parents with the visual needs of the child and to help them arrange for proper eye care.

Another feature is an eye hygiene course, emphasizing accident prevention through recognition of common eye hazards, through the use of goggles and guards for eyeglasses, and through a knowledge of first aid for eye injuries.

Prevention of blindness is stressed also through talks to civic and educational groups, through films and radio programs and through the press. For partially seeing children in rural areas, the Commission maintains a circulating library of large-type books available without charge to teachers who request them. About 150 students are served in this way—just a fraction of the total number who might benefit from the service if adequate support for the work were available.

• Saves County Money

An estimated \$40,000 has been saved the county and state over the past seven years by the prevention of blindness program of the San Bernardino, California, County Welfare Department. During this period, 50 persons received surgery and 34 have

either regained their sight or can now see better than 20/200. During 1951 alone 11 persons had their sight restored through surgery.

INTERNATIONAL CONGRESS

The XVII International Congress of Ophthalmology will meet from September 10 to 17, 1954. There will be a two-day preliminary session in Montreal, Canada, on September 10 and 11, and the Congress will resume on September 13 at the Waldorf-Astoria Hotel in New York. The New York session will continue through Friday, September 17. A single registration fee will cover both the Montreal and New York sessions.

Primary glaucoma and uveitis will be the chief topics discussed. However, a number of papers on other subjects will be included in the program. Communications regarding the meeting may be addressed to the secretary-general, Dr. William L. Benedict, 102-2nd S.W., Rochester, Minnesota.

THE EYES HAVE IT

You have two marvelous cameras, each of which will do the following things:

Focus for any distance merely by pointing, and take a picture of a pinpoint as easily as of a New York skyline.

Shoot both still and motion pictures.

Photograph in color as well as in black and white.

Regulate light by a diaphragm which in turn is regulated automatically by the amount of light itself.

Register pictures on a film which need never be renewed.

Make finished photos with neither developing nor printing.

In her highest flights of creative genius, Nature never produced anything more wonderful than your eyes. Take care of them for they are the only eyes you have.

—Bendixline

AROUND THE WORLD

CANAL ZONE

Recurrent Pterygium—A serious therapeutic problem results from the high incidence and severity of pterygia in the tropical Canal Zone. The etiology is linked with chronic conjunctival inflammation, and improper nutrition is a possible etiologic factor, assert Lieutenant Colonel H. W. Shreck and Captain F. R. Carriker, of the United States Army Medical Corps in an article appearing in a recent issue of the *A. M. A. Archives of Ophthalmology*.

During 1950 and 1951 a total of 170 patients had surgical removal of pterygia at Gorgas Hospital, Ancon. Of these, only 18 per cent were American white persons; 82 per cent were natives of Panama. Fifteen per cent underwent operations for recurrent pterygium.

Inadequate surgical treatment, excessive post-operative inflammatory process, and reexposure of the eye to the same etiologic factors after operation contribute to recurrence of the disease. Removal of the episcleral tissue leaving a bare scleral area, in a definite surgical routine, followed by the use of cortisone to suppress the formation of granulation tissue, is valuable in reducing recurrence rate.

EGYPT

Ophthalmic Section—A total of 106 new ophthalmic units were created by the Ophthalmic Section of the Minis-

try of Public Health in 1950, including 91 permanent and 15 traveling units. Clinical work was done on 1,445,921 new patients and there were 5,698,972 out-patients. More than 210,000 operations were performed; there were about 313,000 ophthalmia cases. Of 41,289 blind patients seen, about 2,500 had cataract.

Ophthalmologists visit institutions and hospitals regularly. Motor car drivers receive eye examinations, and two ophthalmologists are sent to Higaz during pilgrimage to examine and treat pilgrims at Mecca and Medina.

Assistant midwives and health visitors of rural health centers are accepted for training at ophthalmic hospitals of the section. Postgraduate instruction is given to physicians studying for the Diploma in Ophthalmic Medicine and Surgery at Foad I. University. Male attendants are being replaced by female nurses. Modern instruments and appliances are being supplied to ophthalmic units by the Ministry of Public Health. A circulating library is provided with old and new books, monographs, and current journals on ophthalmology.

ENGLAND

Portable Exhibit—The Ministry of Health has prepared an exhibit captioned "Take Care of Your Eyes." It consists of a series of panels illustrating simple methods of eye care, treatment of common complaints, and proper care of spectacles. The exhibit

will be available to local agencies including welfare centers.

FRENCH CAMEROUN

Problems of the Tropics—Dr. Virginia Lubkin, an American ophthalmologist on a working vacation in the French Cameroun, West Africa, writes of the prevalence of ocular disease there, in a letter published in the June 27, 1953, issue of *Pfizer Spectrum*, in the *Journal of the American Medical Association*.

Diseases such as malaria, leprosy, trypanosomiasis, filariasis, syphilis, and the vast roster of unclassified ocular pathology, exact a staggering toll from the nearly three million inhabitants. Medical forces combating disease are pitifully limited to not more than two hundred physicians, including French army medical officers, missionary physicians, and *médecins africains* trained at a French government medical school at Dakar. The witch doctor's reputation has been only slightly blunted by the results of bona fide medical treatment. Within a week of Dr. Lubkin's arrival, the blind began to grope their way out of the interior of the country in response to the message of the jungle drums that there is a "doctor for the eyes" who might be of help.

Dr. George Thorne, assisted by two American nurses and a number of highly skilled African assistants, runs the 250-bed Central Mission Hospital located near Ebolowa. The work load there in 1951 consisted of 8,000 inpatients for nearly 100,000 hospital days, and more than 100,000 clinic treatments and injections. This tiny crew performed in that year 1,800 major and 800 minor operations.

Much of the blindness in the territory is directly attributable to chronic

simple glaucoma. Senile cataract is also frequent. Optic atrophy often may be due to onchocerciasis or to trypanosomiasis. There is a tremendous incidence of ocular involvement from leprosy.

Dr. Lubkin's task was to "give the busy missionary surgeons a refresher on a small group of ophthalmic operations." In the absence of adequate pharmaceutical supplies, glaucoma patients are unable to supply themselves with miotic relief of intraocular pressure. Thus all such cases undergo surgery. Dr. Lubkin placed specific emphasis on iridosclerectomy with iris inclusion for glaucoma patients. In cataract extraction she stressed the technique of corneoscleral suture and occasionally intracapsular extraction.

INDIA

Report of Dr. Mohanlal—In the first annual report, for the year 1951-1952, on the Zonal eye relief scheme of the Ophthalmic Organisation of the Western zone of Uttar Pradesh, India, Dr. Mohanlal outlines its goals.

Irregular eye treatment camps are to be replaced by organized relief. In the past little attention was given to selection and pre-operative, operative, and post-operative care of the patients, often resulting in immediate loss of eyes or secondary complications leading to blindness. The new organization, therefore, established mobile hospitals with bed and tent accommodations for 100 persons and a staff of eight persons including a surgeon; a refraction and technical unit is provided for testing sight and educating the masses. Such mobile hospitals remain at a particular place for 20 days. The mobile units worked

at 40 places in 19 districts during the year, and 8,379 operations were performed.

To make the people eye conscious and to create an effective working organization, district Eye Relief Societies have been formed, which include eye specialists, general physicians, and laymen.

Establishment of clinics in all districts is the final goal of the organization; it will take at least five years before these are completed. Such clinics will be equipped for diagnostic and refractive work as well as the usual facilities of wards, operating rooms, and out-patient departments.

Preventive activities are confined at present to the distribution of literature on the care of the eye and lectures supplemented by films. An anti-trachoma unit is planned. The University of Aligarh has established an international ophthalmic institute for training physicians to perform these badly needed services.

Survey of School Children—A survey recently undertaken by Dr. V. N. Khanna of the K. G. Medical College in Lucknow, India, shows that over 33 per cent of the 1,170 school children tested had defective vision, due for the most part to refractive errors (80 per cent). Most of these had received no correction. Corneal opacities and squint were responsible for 20 per cent of the defective vision. Thirty-seven per cent of the children suffered from malnutrition and 17.5 per cent had active trachoma. Corneal anesthesia affected 436 children (37.26 per cent). Of these, 54 per cent had hyperemia of the conjunctiva, 23 per cent had trachoma, and 25 per cent had roughness of the skin. Vitamin deficiencies apparently play a role in producing hyperemia.

Safety Code Needed—"Prevention is better than cure," writes Dr. Y. K. C. Pandit of the G. T. Hospital, Bombay, India, in a paper on the prevention and treatment of eye injuries in industry, which appeared in a recent issue of *Proceedings of the Society for the Study of Industrial Medicine*. He emphasizes the need for a National Safety Council and a Standard Safety Code in India, and outlines safety measures which should be provided by the factory as well as first-aid measures to be taken in case of eye injury. An extensive section of Dr. Pandit's paper, devoted to chemical injuries of the eye, points out that each variety of chemical injury requires special treatment, and indeed each chemical compound merits special attention.

INDONESIA

Public Health Problems—The diseases most prevalent among Indonesia's 75 million people are malaria, which afflicts 30 per cent of the population; tuberculosis, which kills at least 189 per 100,000 each year; typhoid fever, paratyphoids, dysenteries, and the diarrheas. Other widespread maladies include leprosy, trachoma, leptospirosis, tropical ulcers, skin infections, helminthiasis, and a high incidence of venereal disease (10-20 per cent of the urban population are afflicted with the latter).

Among the vitamin deficiencies, that of vitamin A is most widespread. The frequent appearance of eye infection and subsequent blindness can be attributed to its lack. Avitaminosis A may also be responsible for the formation of kidney and bladder stones (in some hospitals this condition accounts for ten per cent of all pediatric surgery).

At present there are 1,000 to 1,400 physicians in Indonesia, or one practicing physician per 75,000 population.

ISRAEL

Trachoma Reappears—Although the activities of the Hadassah Anti-Trachoma Service had brought about the virtual eradication of trachoma in Israel by the end of 1947, the mass immigration of Oriental Jews from North Africa, Southern Arabia, Persia, and Iraq in the last three to four years has resulted in the reappearance of the disease. Over 63,000 active cases are reported. Trachoma is present in 79.83 per cent of immigrants from Yemen, 24.80 per cent of those from North Africa, 13.19 per cent of those from Iraq, and 1.20 per cent of the European immigrants. The greatest proportion of cases is found in school children in rural new immigrant settlements. Hadassah and the Workers Sick Fund have made an attempt to cope with the problem, but government aid is necessary. In 1950 the Ministry of Health instituted a pilot experiment designed to detect and treat existing cases as well as carriers in the schools of the Arab and Jewish settlements. Lack of personnel and health education hamper the success of this program. However, the campaign is being extended gradually throughout the country.

LIBYA

Teacher Training Aids—A sample selection of pamphlets and posters published by NSPB was sent in March to the head of the UNESCO Mission in Libya, in response to a request from him for materials which might be useful in work in that country. The correspondent states that two to three per

cent of the people there are blind. The country is poor in resources owing to the ravages of the second World War and years of foreign rule.

SOUTH TUNISIA

Trachoma Index—The trachoma index in the district of Djerid is 85 per cent, and as high as 92 per cent in some schools, according to a recent article in *Revue Internationale du Trachome*, by Dr. F. Malnou. In spite of a program of 320,000 medical treatments per year, the majority of trachoma patients have not yet been seen.

Of 2,300 patients, 204 had corneal leucoma; 97 of these were adherent and 26 were glaucomatous. Ten per cent were practically blind and four per cent totally blind. Trichiasis occurs in 25 per cent of the cases, and lachrymal obstruction in 60 per cent, particularly in women. Milk injections are effective in subduing the subjective symptoms.

WORLD HEALTH ORGANIZATION

New WHO Director—Dr. M. G. Candau was appointed director-general of the World Health Organization at a recent session of the World Health Assembly. He assumed the position on July 21, 1953, upon the expiration of Dr. Brock Chisholm's five-year term.

Trachoma Research—In a recent issue of the *Chronicle of the World Health Organization* it was announced that Dr. Yosio Kawakita, an eminent Japanese virologist, has been lent by the Chiba Medical University in Japan to WHO for trachoma research at Memorial Ophthalmic Laboratory, Giza, Egypt. Dr. Kawakita has helped to organize a course on trachoma and participated in an ophthalmologic seminar held in February 1953 at Cairo.

CURRENT ARTICLES

Control of the Concentration of Oxygen in Tents for Premature Babies. A. L. Gunn, W. K. Sutton, and M. Ulusoy. *British Medical Journal*. No. 4798. pp. 1338-1339. December 20, 1952.

Oxygen tents are in general use in hospitals to treat premature or sick babies. The question arises whether retrolental fibroplasia may be caused by high concentrations of oxygen, or the sudden diminution of oxygen concentration when the infant is removed from a high oxygen atmosphere. Tests show that when the flow-meter registers from one to two liters of oxygen per minute, the oxygen concentration in the tent may vary between 30 and 80 per cent. A simple method is given for obtaining the desired concentration with certainty.

After the flow-meter registers a uniform flow for 45 minutes, a fairly constant oxygen percentage is obtained in the tent. The concentration of oxygen has no constant relation to the flow recorded on the meter. A proportionate change in the flow would result in the required adjustment in concentration. Since this concentration varies with different tents, it can be ascertained only by analysis. A single calibrating test should be taken 45 minutes after the tent has been closed and the flow-meter set, and again whenever there is any doubt, or if the conditions are changed. The period required to obtain constant

oxygen concentration in a tent is shortened to 30 minutes by running the flow-meter at three times the intended rate for five minutes and then reducing the flow to normal for 25 minutes.

Incidence of Retrolental Fibroplasia in a New York Nursery. A. Silverman, F. C. Blodi, J. C. Locke, R. L. Day and A. B. Reese. *A. M. A. Archives of Ophthalmology*. Vol. 48. p. 698. December 1952.

A study of the incidence of retrolental fibroplasia by weekly examinations in two premature nurseries in New York City during 1950 and 1951 yields the findings given below:

1. The incidence of retrolental fibroplasia was not related to cutaneous hemangiomata, although they have in common an inverse relationship to birth weight.

2. An inverse relationship was found between birth weight and the age at which the first fundus changes appeared. No significant relationship existed between gestational age at birth and time of clinical onset of the disease.

3. When the effect of birth weight was eliminated there was no significant correlation between the time of clinical onset and the time when oxygen therapy was discontinued.

4. The frequency distributions, with respect to birth weight, gestational age, and the two factors simultane-

ously, of surviving infants whose birth weight was less than 1,700 grams, were not significantly different in the two years under comparison.

5. The details of postnatal care remained unchanged during the two years.

6. The incidence was higher in 1951 than in 1950.

7. Severe cases were more numerous in 1951.

8. The severity of the disease was not related to the degree of prematurity.

Drug Sensitivities and Irritations of the Conjunctiva. F. H. Theodore. *The Journal of the American Medical Association*. Vol. 151. p. 25. January 3, 1953.

The author states that although most instances of ocular drug intolerance are due to drug allergy there are enough cases of drug irritation to make it an important consideration. Drug sensitivity is a form of contact allergy characterized by itching, dermatitis, catarrhal conjunctivitis, and conjunctival eosinophilia or basophilia. Local anesthetics, antibiotics, sulfonamides, mydriatic alkaloids, and mercurials are among the drugs most likely to cause sensitization. When allergic dermatconjunctivitis develops elimination of the drug causing the reaction is necessary.

Drug irritants cause reactions by direct conjunctival irritation. Some drugs are themselves primary irritants, and almost every drug may at times be irritating. However, the clinically important ones are those used regularly over long periods. Some of these may deteriorate into irritating products if precautions are not taken to prevent their breakdown. The alka-

loids, especially the miotics, as well as other chemically related medicinals, are most apt to do this. The clinical picture of irritative conjunctivitis due to drugs is generally a nonspecific watery conjunctivitis, without dermatitis or eosinophilia. In chronic cases, especially when alkaloids are used, follicular conjunctivitis is the outstanding manifestation. General factors such as the hydrogen ion concentration should be considered in compounding nonirritating preparations of any ophthalmic drug. These are especially important in alkaloids and related synthetic miotics. This entire group of drugs tends to form irritative degradation products, and in many instances these irritating substances are similar.

Drug irritation can be avoided by using properly prepared solutions, while in drug allergy a different drug should be substituted. It is of great importance, therefore, to make the distinction between these two types of drug intolerance.

New Treatment for Calcific Corneal Opacities. W. M. Grant. *A. M. A. Archives of Ophthalmology*. Vol. 48. p. 681. December 1952.

This report from the Howe Laboratory of Ophthalmology, Harvard Medical School and the Massachusetts Eye and Ear Infirmary describes a method by which the neutral sodium salt of ethylenediamine tetraacetic acid (EDTA) may be utilized to dissolve calcific corneal opacities occurring in the clinical entity of band keratopathy or as a result of lime burns. If epithelium lies over the opacity, it must first be removed. The denuded area is then irrigated for 15 minutes with a sterile 0.01 M solution

of EDTA. This is done under topical anesthesia.

In the case of fresh-lime burns with a ground glass type of corneal opacity it is advantageous to apply the solution before the epithelium grows over the opacity (within the first 24 hours). However, this need not be regarded as an emergency procedure, provided that thorough irrigation and cleansing of the conjunctival sac are carried out with water or saline solution as soon as possible after exposure.

Retrolental Fibroplasia — Ophthalmoscopic Findings During the First Two Weeks of Life. L. P. Guy, J. Dancis and J. T. Lanman. *American Journal of Ophthalmology*. Vol. 36. pp. 85-89. January 1953.

In a study at the Bellevue Premature Unit, aided by research funds from the National Society for the Prevention of Blindness, it has been found that if no ocular abnormalities are exhibited during the first two weeks of life, it is unlikely that advanced signs of RLF, namely, retrolental separation of cicatrix, will ensue. If vitreous haze, myopia, or dilation of the retinal vessels are present in the first two weeks, advanced RLF may develop. Twelve cases of 77 showing abnormalities did so develop. Birth weight is an important factor bearing an inverse relation to the incidence of anomalies; their presence in infants of low birth weight during the first two weeks of life has a more serious prognosis.

Early abnormalities may indicate an eye that is susceptible to retrolental fibroplasia, i.e., an immature eye; or the abnormal findings may be the early signs of retrolental fibroplasia,

and those infants who revert to normal may represent abortive cases. No conclusion can be drawn at present as to which interpretation is correct.

Preglaucoma. F. Carballo and J. Hick. *Archivos de Oftalmología de Buenos Aires*. Vol. 28. pp. 32-33. January 1953.

The classical texts have called attention to the signs and premonitory symptoms of incipient glaucoma. Its diagnosis is not easy, and it is important always to remember the following suspicious symptoms: rapid increase of presbyopia, headaches, transitory cloudiness of vision, sensation of ocular repletion, and light pain in the eyes after staying in the dark, or after other vasomotor stimulants (bath, coffee, etc.). Photophobia, retinal asthenopia, blurred vision, and increased changing ocular tension are also signs of preglaucoma.

The interesting point of two related cases of preglaucoma which the authors report is the complaint of cloudy vision in darkness, especially while at motion pictures (which is practically a test of spontaneous obscureness), with altered tension verified as more than six millimeters of mercury. This points to a preglaucoma and confirms the importance of this preliminary test.

Intra-Ocular Pressure in Primary Congestive Glaucoma. S. J. H. Miller. *British Journal of Ophthalmology*. Vol. XXXVII. pp. 1-10. January 1953.

This study indicates that the periodic symptoms of early congestive glaucoma are always associated with raised intraocular pressure and that between such episodes the eye may appear healthy, react normally to

tests, produce no symptoms, and have normal intraocular pressure. Since the symptoms and attacks of raised intraocular pressure are contemporaneous and episodic, the chances of detecting the disease in its early stages are enhanced by measuring the intraocular pressure when symptoms are present. Precipitating factors are motion pictures, television, darkness, emotional crises, and prolonged visual concentration. Sleep, rest, daylight, miotics, a filtering operation, and iridectomy relieve the symptoms. As the disease progresses, miotics may mask symptoms without controlling tension, and in a majority of cases surgery becomes necessary.

A comparison of congestive and simple glaucoma points out many distinct features during the early stages. The later stages, however, are barely distinguishable, and this may provoke doubt concerning the existence of two distinct syndromes.

A Study of Glaucoma Secondary to Cataract Extraction Based on 500 Senile Cataract Extractions. L. T. Post and L. B. Harper. *American Journal of Ophthalmology*. Vol. 36. pp. 103-108. January 1953.

This study is based on the histories of 35 cases of glaucoma following cataract extraction. Certain complications at operation as well as postoperatively seem to account for a great majority of the cases studied. Since postoperative glaucoma in previously nonglaucomatous eyes can almost always be attributed to some unfortunate event connected with the surgery, methods and techniques must be utilized whereby complications can be avoided or forestalled.

A detailed section on preoperative

care is followed by a discussion of postoperative complications, their causes, and techniques useful in their elimination. Preoperative tension should be determined tonometrically to be sure glaucoma does not exist. Prognosis in glaucoma caused by cataract is good under either medical or surgical management. If complications occur, patients should be observed frequently after operation to detect the first signs of the disease. Moreover, even after uneventful cataract surgery, observation should be made after six and 18 months for postoperative glaucoma.

Idiopathic Detachment of the Retina. T. R. Smith and L. H. Pierce. *A.M.A. Archives of Ophthalmology*. Vol. 49. pp. 36-44. January 1953.

The records of examinations of patients by the retina service of the Massachusetts Eye and Ear Infirmary between 1947 and 1951 are reviewed to ascertain the preoperative findings and operative techniques which influence reattachment of the retina. Research funds of the National Society for the Prevention of Blindness were used in partial support of this study.

Of 618 cases of idiopathic detachment of the retina, 525 were considered operable. Among the other 93, two were not physically able to tolerate treatment; the rest had detachments of long duration with more than one of the following findings: total separation, atrophic retina, extensive fixed folds, massive retraction of the vitreous, and retinitis proliferans. Most of these eyes were either blind or had vision approximating light perception only. In 70 per cent (316) of the eyes operated on, successful reattachment of the retina persisted for six or more months after retinopexy. If 65 appar-

ently successful cases in which the six-month follow-up period is incomplete are included, 74 per cent of the operations were successful.

Preoperative findings indicating poor prognosis for retinal reattachment are detachment of the macula, fixed folds of the retina, total retinal detachment, no retinal breaks or two or more breaks, and aphakia. On the other hand, cases with lattice-like degeneration of the retina had good prognosis. Age apparently was not a significant factor. Variations in the methods of treating breaks and releasing subretinal fluid had no demonstrable effect on therapeutic results. Prognosis was better when it was not necessary to release subretinal fluid.

Preoperative vitreous hemorrhage occurred in at least one-tenth of the cases, and detachment of the retina in the fellow eye in 27 per cent. Myopic patients have retinal detachments at an earlier age than do patients with other refractive errors.

Terramycin in the Prophylaxis of Ophthalmia Neonatorum. D. O'Brien. *The Lancet*. Vol. 262. p. 347. February 16, 1952.

The value of topical administration of terramycin ointment and solution in the prophylaxis of ophthalmia neonatorum was tested in 1,047 infants at the Hammersmith Hospital, London. Of 254 male infants treated with terramycin drops, seven (2.9 per cent) developed ophthalmia; in the control group of 264 female infants, ten (4.0 per cent) became infected. Terramycin ointment was administered to 270 male infants; the untreated control group consisted of 259 females. Twelve cases of ophthalmia (4.5 per cent) developed in the ointment-treated group,

and 18 (7.0 per cent) in the untreated controls. The difference in incidence of ophthalmia between the treated and untreated infants was not significant in either group. The authors conclude that terramycin is of no value in preventing ophthalmia neonatorum. Simple cleaning of the eyelids is as effective as any other form of topical prophylaxis.

Physical Fitness of Priority 1 Physicians Under Public Law 779. Analysis of Causes of Rejection for Military Service. H. S. Diehl, M. D. West, and P. K. Kaetzel. *Journal of the American Medical Association*. Vol. 151. pp. 601-604. February 21, 1953.

Of 8,914 priority 1 physicians examined for fitness for military service up to February, 1952, 2,119 were physically disqualified. Of the 1,074 rejections which took place before November, 1951, eye conditions accounted for 45. Twenty rejections were made because of refractive errors, and 25 for other eye conditions.

Clinical and Laboratory Research in Connexion with a Criterion of Cure in Trachoma. M. J. Freyche, R. Nataf, J. Maurin, and P. Delon. *World Health Organization*, Trachoma, 35. February 9, 1953.

The observations in 50 cases of cicatricial trachoma treated with instillations of cortisone several times daily are reported. Most authors agree that if microscopic examination of conjunctival scrapings show any sign of Hälberstadter-Prowazek bodies, rickettsoid bodies, or "plastilles ponctuées" the disease should not be considered cured, even if the clinical and biomicroscopic picture shows no active lesion. If the microscopic examination

gives negative results and the clinical and biomicroscopic examination shows an entirely cicatrized trachoma IV, the patient may be pronounced cured. Nevertheless, certain cases of apparently cured trachoma suffer relapse even after a considerable period of time, and to date there is no indisputable criterion of cure. It has been indicated that the local application of cortisone produces clinical reactivation of trachomatous lesions. Thus, the use of cortisone may establish such a criterion.

Forty-eight patients in whom none of the active symptoms of trachoma were present, and two patients in whom trachoma was not entirely cicatrized in one eye, were selected for this study. Each patient received four instillations per day of cortisone acetate (6.25 mg/cc) suspended in saline. Biomicroscopic examination was made daily, and conjunctival scrapings were studied microscopically every 48 hours. Thirteen cases indicated reactivation of the trachoma virus. Two of these were the patients in whom cicatrization was not complete in both eyes. In one of these cases clinical as well as microscopic reactivation appeared in the eye which was not entirely cicatrized, but not in the other eye. The second case showed no clinical or biomicroscopic change, but microscopic examination demonstrated reactivation of the virus in both eyes. Of the other 11 cases which were reactivated, only 4 showed signs (usually slight) of clinical reactivation. In the remaining 37 cases, despite the administration of cortisone, the clinical, biomicroscopic, and microscopic picture was unchanged.

The reactivation of latent trachoma virus always occurred between the

third and eleventh day of cortisone administration. In some cases reactivation was transitory and in others it was prolonged. Reactivation was characterized by the appearance of rare inclusions (initial and elementary bodies) or, more frequently, of rickettsoid bodies. Only rarely a small number of "plastilles ponctuées" appeared in reactivation.

It is concluded that (a) the virus is present in a latent form in a number of patients with entirely cicatrized trachoma, but is inaccessible to the usual means of investigation; and (b) the local application of cortisone may reveal the presence of the latent virus. The authors caution that these observations must be confirmed, and point out that the practical value of the test is lessened because of the several-day period during which the patient must be observed. It is suggested that a simple reactivation procedure may be found either by modifying the means of administering cortisone or by studying substances which are chemically related to cortisone.

Nystagmus. C. W. Rucker. *American Journal of Ophthalmology*. Vol. 36. pp. 250-258. February 1953.

Nystagmus, involuntary to-and-fro movement of the eyes, apparently results from a disturbance within a complex apparatus which keeps the normal eyes in constant relation to their environment. It is intimately concerned with equilibrium. Lesions affecting different parts of this apparatus produce different types of nystagmus. The nature of the nystagmus is sometimes indicative of the site of the causative lesion. A simple anatomic classification for clinical purposes is of

help in interpreting its various forms.

Nystagmus may be classified in four distinct groups: (1) optic nystagmus is due to optokinetic defects or faulty vision; (2) labyrinthine nystagmus arises from stimulation or depression of the peripheral vestibular apparatus of the inner ear. Rotation of the head, caloric stimulation, peripheral vestibular disease, and postural vertigo may produce nystagmus in patients with labyrinthian disorders; (3) muscular nystagmus is caused by weakness of the extraocular muscles, and includes physiologic neuromuscular nystagmus and parietic nystagmus; (4) central nystagmus arises in the central nervous system and may result from lesions in the cerebellum, the region of the vestibular nucleus, and the medial longitudinal fasciculus. Other types of nystagmus, which defy classification in the preceding categories, include hereditary, latent, occupational, voluntary or hysterical, and toxic.

Examinations for nystagmus and manifest weakness of the extraocular muscles may be conducted concurrently. Observation of the eyes in various positions reveals variations in movement indicative of several varieties of nystagmus arising from the visual system, the labyrinth, muscles of the eye, or the central nervous system.

Army Ophthalmology, Past and Present. Col. J. H. King, Jr., M. C., U.S.A. *The Military Surgeon*. Vol. 112. pp. 88-96. February 1953.

The Army has established ophthalmology as a full time specialty, to be organized for rapid enlargement in time of war. Combat experiences prove that disability from loss of vision is

more serious than that from the loss of many other functions.

In the Revolutionary War and the War of 1812 brilliant surgeons were active in ophthalmology. However, such primitive methods as "blistering and bleeding" were used in treating many eye conditions, with little eye surgery; enucleation was frequent; anesthetics and asepsis were unknown.

During the Civil War improvements were made in spectacles, and ether was available, but local anesthesia was still nonexistent. The retinoscope and ophthalmoscope came into use, although the latter was not used in field hospitals. Many military surgeons practiced ophthalmology both part time and full time. On the Texas frontier in 1876 snow blindness was treated; cocaine was used in two eye operations in 1886.

With the occupation of Cuba, Puerto Rico, and the Philippines after the Spanish-American War, tropical ophthalmology became an important phase of Army ophthalmology. In this period, concentration of specialists and special equipment in general hospitals was begun by the Army.

World War I brought the establishment of ophthalmology as a section under the Division of Head Surgery. As part of a civilian consultant service 612 ophthalmologists were assigned to duty in France. Progress was marked by X-ray localization of intra-ocular foreign bodies, their removal by magnet, careful outlining of indications for enucleation, and rapid evacuation of eye casualties to specialized care. The postwar discharge of civilian specialists made it necessary for the Army to train younger men as specialists to man the larger hospitals.

Civilian resources supplied the bulk of medical care and specialists in World War II; most of the Regular Medical Corps held administrative posts. Skill and training, rapid evacuation of eye casualties from combat zones, medical and surgical advances in ophthalmology, modern drugs, better techniques and equipment reduced eye loss. Eye care in the various theaters was coordinated; centers for treatment and training of the blind were established in the United States. The Army method of fabrication of the plastic artificial eye is used universally. The rehabilitation of approximately 90 per cent of blind soldiers, compared with 25 per cent in World War I, is one of the greatest achievements in military ophthalmology.

At present the Army has a comprehensive training program for specialists in ophthalmology, optometrists, and related personnel. Hospitals in the United States and abroad have eye centers. The chief of ophthalmology at Walter Reed Army Hospital is also assigned as chief of the ocular research unit for the Army and consultant to the surgeon general; the chief at Tokyo Army Hospital is consultant in ophthalmology to the surgeon of the Far East Command; the senior ophthalmologist at Frankfurt acts as consultant to the surgeon of the European Command. Army area surgeons in the states utilize chiefs at adjacent Army hospitals as eye consultants.

Advances in professional care make the work in Korea more effective. The percentage of eyes saved is inversely related to time of evacuation and treatment; best results are attained in cases receiving definitive treatment within 24 hours after injury. A few cases of apparently unsuccessful treat-

ment may have resulted from too rapid postoperative evacuation. Eye patients evacuated on litters to the United States by air arrived in the best condition. A mass program of oral and topical treatment with aureomycin and terramycin has apparently controlled an epidemic of follicular conjunctivitis and trachoma, among Communist prisoners of war.

The Ocular Research Unit, under the Research and Development Board of the surgeon general's office, was established at Walter Reed Army Medical Center in 1948. It is directing the development of the "meta Magnet" and investigations on uveitis and ocular toxoplasmosis, as a possible cause of chorioretinal lesions. This unit reported the first positive culture of *Leptospira* from aqueous humor, opening a new field in diagnosis and treatment. Improved treatment for ocular trauma, problems with atomic radiation, development of new equipment and drugs, use of contact lenses under military conditions, and vision and muscle balance in accidents are under study. An improved surgical eye chest for field use is now at the pilot model stage. The activities of the Society of Military Ophthalmologists offers a means of exchange of ideas.

Perforating Injuries of the Globe.

J. R. Duke and R. A. Schimek. *American Journal of Ophthalmology*. Vol. 36. pp. 375-378. March 1953.

Statistical analysis of 444 patients with perforating ocular injuries revealed that such injury occurred twice as often before age ten as in any subsequent decade, and four times as often in males as in females; 63 per cent of the patients were white and 37

per cent colored; the right and left eyes were involved with equal frequency.

The final visual acuity in 249 patients with simple perforating injuries follows: enucleated, no light perception (NLP) and light perception (LP), 57 per cent; high myopia (HM) to 20/100, 16 per cent; 20/70 to 20/20, 27 per cent. In 60 cases of intraocular and double perforating foreign bodies, the following visual acuity was achieved: enucleated, NLP, and LP, 55 per cent; HM to 20/100, 20 per cent; 20/70 to 20/20, 25 per cent. The visual prognosis in simple perforation when immediate enucleation is not mandatory follows: 20/40 to 20/20, 33 per cent; 20/70 to 20/50, four per cent; 10/200 to 20/100, eight per cent; HM to 9/200, 13 per cent; LP, 14 per cent; enucleation or NLP, 27 per cent.

Initial complications were uveal prolapse (seven times more frequent in simple perforation than in foreign body perforation), lens damage (the most frequent complication in foreign body perforation), and vitreous loss. In simple perforation final visual acuity was most adversely influenced by lens damage, and to a lesser degree by length of laceration. Neither uveal prolapse nor age influenced the final visual result. Better visual results occurred in injuries from sharp agents than from blunt ones, and gunshot injuries had the worst prognosis.

The presence of a foreign body or lens damage was associated with a higher incidence of infection. The majority of intraocular infections resulted in enucleation or very low visual acuity. Treatment with penicillin did not result in significant improvement. Initial surgical treatment in simple perforation was required in

85 per cent of the cases (57.4 per cent required direct closure, 19.8 per cent enucleation, eight per cent other surgery).

Sympathetic ophthalmia occurred in three out of 208 cases (1.4 per cent), two of which were proven by pathological examination.

Infection of Eye Due to *Pseudomonas Aeruginosa* Treated with Polymyxin B and "Varidase." V. O. Eareckson, Jr., J. M. Miller, and P. H. Long. *A.M.A. Archives of Ophthalmology*. Vol. 49. pp. 158-160. February 1953.

Pseudomonas aeruginosa infections of the eye generally result in severe loss of vision or enucleation. Polymyxin B and "varidase" (streptokinase-streptodornase) used in combination distinctly aided in the therapy of such a case. The probability of toxic reactions and tissue sensitization was minimized by administering less than 2.5 mg. of polymyxin B per kilogram of body weight daily. "Varidase" removes and hydrolyzes fibrin and desoxyribonucleoprotein. Thus, it facilitates the action of humoral forces and drugs, enhances the action of leucocytes, and hastens the normal process of repair. The removal of pus by "varidase" permits more effective contact of the antibiotic, polymyxin B, with bacteria.

The patient who was able to count fingers only at one foot the day before treatment began could do so at two feet following treatment. A dense, vascularized leukoma persisted in the center and nasal portions of the eye. The temporal cornea remained clear. Application of these agents earlier in the course of the infection might have saved more vision. The authors

suggest further trial of the drugs in the management of severe *Pseudomonas aeruginosa* infections and their prophylactic use when this type of infection is suspected.

Treatment of Common External Ocular Diseases. J. B. Rogers. *Medical Times. The Journal of General Practice*. Vol. 81. pp. 183-185. March 1953.

The newer sulfonamides (sulfacetimide, gantrisin, and sulfamylose), particularly 30 per cent sulfacetimide, provide the best treatment for external ocular infections, are stable in solution and do not require special storage conditions. A combination of sulfonamide drops during the day and antibiotic ointment at night clears most conjunctival infections within a few days. The physician is cautioned to inquire about drug allergies before prescribing therapeutic agents, particularly among antibiotics.

Corneal abrasion, detected by staining with two per cent fluorescein, responds favorably to treatment with 30 per cent sulfacetimide solution. Pain should be controlled with analgesics rather than local anesthetics. Foreign bodies in the cornea and fornix should be removed by the physician with a sharp, clean, sterile spud (e.g., a new sterile hypodermic needle), and subsequently treatment should be administered as outlined for corneal abrasion. Foreign bodies in the pupillary area and intraocular foreign bodies should be removed by an ophthalmologist. Subsequent to thorough lavage with saline, boric acid ophthalmic ointment provides buffer and protective action in cases of chemical and thermal burns; atropine is used to relieve ciliary spasm; and cortone may be used after epithelial

healing to decrease inflammatory reaction. In cases of severe contusion and blast injuries careful examination should be undertaken for signs of dislocated lens, separation of ciliary body from sclera, glaucoma and globe perforation or rupture. The pupil should be dilated with 10 per cent neosynephrine and the fundus thoroughly checked for signs of hemorrhage, exudates or retinal detachment. Vision should be recorded and confrontation visual fields done.

Alleged Effects of Tinted Lenses to Aid Vision in Night Driving by Reducing Ultraviolet Light. P. W. Miles. *American Journal of Ophthalmology*. Vol. 36. pp. 404-405. March 1953.

This communication to the editor criticizes advertisements which advocate the use of tinted lenses that reduce ultraviolet light as a visual aid in night driving. The claim is made in the advertisements that ultraviolet light prevents rapid dark adaptation. Although excess visible light during the day reduces the speed of dark adaptation at night, invisible light does not affect dark adaptation in a similar manner. Ultraviolet light is not only incapable of stimulating the retina, but the cornea and lens prevent such light from even reaching the retina. Thus, the tinted glass which cuts out ultraviolet light simply removes a light component which would ordinarily be removed by the cornea and lens. The advertisements depend on the supposition that driving at night involves chiefly dark adapted vision, which it does not. At the illumination levels encountered in driving under automobile headlight illumination at night, dark adaptation does not ex-

ceed one-tenth of its full extent. The maximum dark adaptation produced when approaching headlights are 900 feet ahead would be about 50 per cent. Thus, the advertisements which state that tinted lenses are helpful in night driving are misleading.

Prenatal Syphilis. J. O. Quiason and L. M. Ibarra. *Journal of the Philippine Medical Association*. Vol. 29. pp. 105-113. March 1953.

Of 302 syphilitic pregnant women seen between 1947 and 1951, only 95 were completely and properly treated and adequately followed up. Ninety-three cases were suffering from latent syphilis and two from secondary syphilis. Early and thorough clinical history, physical examination, and routine serological testing are necessary in prenatal care; they should be undertaken before the fifth month of pregnancy to prevent early or congenital syphilis. Penicillin alone is the drug of choice in the treatment of syphilis in pregnancy, since it has less tendency to produce reaction than does penicillin in combination with mapharsen and bismuth therapy. Eighty-eight infants were born apparently normal, and 54 of these were examined physically and serologically. Only three cases gave weakly positive serological reaction.

Twenty-seven Years of Cataract Surgery in Review. W. E. Vandever. *Texas State Journal of Medicine*. Vol. 49. pp. 131-134. March 1953.

Since 1925 varying suture techniques have been used for the conjunctival flap. At the present time the author uses the 6-0 chromic catgut suture.

An important aspect of preparation

of the patient for cataract surgery is lid akinesia. Dilatation of the pupil is accomplished with 0.5 per cent pontocain drops with adrenalin and 10 per cent neosynephrine. Retrobulbar injection of two per cent novocain is used, as well as novocain injection of the superior rectus tendon area and the upper lid. The addition of hyaluronidase to the novocain-adrenalin solution produces more rapid and complete anesthesia.

A conjunctival flap is made to expose the superior rectus tendon and facilitate passage of the stay suture, and the lens is removed in the capsule. Extraction with full iridectomy appears to be the safest and easiest procedure. However, the outlook for round pupil extraction with peripheral iridectomy is improving.

Cultivation of Virus of Epidemic Keratoconjunctivitis on Chorio-allantoic Membrane of Fertile Egg. F. N. Sezer. A. M. A. *Archives of Ophthalmology*. Vol. 49. pp. 293-302. March 1953.

The principal characteristics of epidemic keratoconjunctivitis are sudden acute follicular conjunctivitis, glandular adenopathy, and small infiltrates in the deeper epithelium and Bowman's membrane. Evidence since 1930 indicates that a filtrable virus is the etiologic agent of the disease. Conjunctival scrapings from epidemic keratoconjunctivitis patients failed to produce lesions on the chorio-allantoic membrane of fertile chicken eggs, although the same material was pathogenic to mice inoculated intracerebrally. However, the virus is maintained by transplant onto the chorio-allantoic membrane of human cornea on which the virus has been kept

viable. After several passages to new chorio-allantoic membranes, the virus produced mild epidemic keratoconjunctivitis in two human volunteers and was pathogenic to mice. No pathologic changes were produced on rabbit cornea. The virus can be maintained through numerous generations on chorio-allantoic membrane.

Convergence Insufficiency: Incidence among Military Personnel and Relief Orthoptic Methods. P. R. Kent and J. H. Streeve. *Military Surgeon*. Vol. 112, pp. 202-205. March 1953.

One of every 20 to 32 patients referred to the refraction clinics of two naval hospitals had convergence insufficiency accompanied by symptoms. The most frequent complaints were headache, blurring of print, ocular fatigue and occasional diplopia. The average afflicted patient revealed exophoria at distance slightly above normal and considerably above normal at near point. All had low prism convergence at near point in comparison with the phoria at the same distance. The complaints were similar to those reported in cases of uncomplicated refractive error. The authors describe a simple method of orthoptic training employing loose prisms.

Tobacco-Alcohol (Toxic) Amblyopia. H. W. Maxwell. *Texas State Journal of Medicine*. Vol. 49, pp. 137-140. March 1953.

Toxic amblyopia, or visual loss from the absorption of external poisons, attacks the subchiasmal portion of the visual pathway so that hemianopia and quadrant defects in the visual field as well as nerve bundle effects do not occur. The effects are always bilateral, and in general are reversible.

Tobacco-alcohol amblyopia is characterized by bilateral impairment of central vision, inability to distinguish between red and green, and an intact peripheral field without ophthalmoscopic changes. Most cases become evident after a depression of general health; for example physical depression, malnutrition, and less frequently after acute illness. Undernutrition, especially deficiency of vitamin B₁, seems to be a greater factor than tobacco or alcohol.

With abstinence from tobacco and alcohol and proper diet including vitamin B₁, vision improves.

There is a question whether pathologic changes such as degeneration of retinal ganglion cells and atrophy of nerve fibers are due to neurotoxins or whether they are vasoconstrictive causing secondary neurogenic degeneration.

Ocular Reaction to Lens Protein. A Preliminary Study F. W. Law. *British Journal of Ophthalmology*. Vol. 37, pp. 157-164. March 1953.

The occurrence of sympathetic ophthalmia due to phaco-anaphylactic response subsequent to cataract extraction is agreed upon by most writers. Clinical and particularly histological evidence lend strong support to this view. Difficulties of interpretation arise in histological studies in that inflammatory invasion of lens remnants in an eye following extracapsular extraction may or may not be caused by abnormal sensitivity to lens protein. This reaction may be caused by an inherent sensitivity on the one hand, while on the other hand the possibility exists that the reaction is induced by earlier transudation through an intact capsule of the products of lens autolysis. Further research is

necessary to differentiate between phaco-anaphylaxis and mild or early sympathetic ophthalmia. The correlation of clinical and histological findings will be attempted by the author and investigation will be made of the significance of invasion of lens matter by inflammatory cells. The investigation of a pre-operative sensitivity test is proposed to determine the need for pre-operative desensitization.

Retrolental Fibroplasia and Other Forms of Pseudoglioma. C. H. O. M. von Winning. Drukkerij Trio, 'S-Gravenhage. 1952.

Part I. Retrolental Fibroplasia. This well-documented review of the known aspects of retrolental fibroplasia (RLF) contains an historical review; a section on the incidence of RLF, relation of prematurity, increased incidence, and geographical distribution; and a description of the clinical picture. The disease was unknown in the Netherlands prior to 1948, but its incidence has increased since then. No sex difference is noted.

In the clinical observation of 18 cases it was noted that in the active phase changes are dramatic and pathognomonic for RLF. However, in the final stage the picture is less characteristic and RLF is difficult to distinguish from other forms of pseudoglioma. Changes occur in the anterior chamber as well as the fundus and run parallel courses. The anterior chamber becomes shallow; a definitely positive Tyndall effect is evident in the absence of cells in the anterior chamber. Numerous dilated vessels appear in the iris. Fine translucent fibrils spread from the detached retina into the vitreous, which are perceptible only before the complete formation of the

membrane behind the lens. Although relapse is infrequent, RLF patients should be followed up so long as the Tyndall effect remains positive. Edema, hemorrhage and separation of the retina; formation of new vessels; and organization of the vitreous result from the eyes' reaction to the influence of toxins. These changes indicate that a factor is operating whose effects are distributed via the vascular system.

RLF is non-hereditary; its etiology is not yet established. Prenatal factors such as parity, twin pregnancies, and toxoplasmosis of pregnancy are rejected as causative factors. Postnatal weight loss, time in which original birth weight is regained, and RLF seem related. The disease is reported to occur more frequently in infants receiving oxygen therapy. One explanation is that *hyperoxia* causes direct tissue damage. Conversely, it is postulated that *anoxia*, which leads to oxygen administration, causes the disease. The latter rationale appears justified. These ideas are not incompatible: *hyperoxic anoxia*, acute anoxia due to inhibition of oxidative enzyme systems by high levels of oxygen, may describe the true condition, reconciling the opposing views. Vitamin and mineral supplements, human milk (rather than formulae), ACTH, cortisone, and surgery yield disappointing results in the management of RLF.

Part II. Other Forms of Pseudoglioma. Three types of developmental pseudoglioma are discussed: *Persistence and hyperplasia of the primary vitreous* is associated with persistence of vessels of the pupillary membrane and capsulo-pupillary vessels, and in one case hyperplasia of both areas. Partial development, cataract formation, resorption of lens, and accom-

panying coloboma are reported. The condition is of unknown etiology. Surgical treatment is possible, but generally unnecessary since the disease occurs unilaterally. *Ablatio falciformis retinae* is a congenital fold, has been established as hereditary, and occurs in full term infants. *Retinal dysplasia*, a developmental abnormality of the retina, leads to bilateral total pseudoglioma, is often accompanied by abnormalities elsewhere, and is hereditary in some families.

Inflammatory pseudoglioma may result from infections elsewhere in the body.

Part III. Differential Diagnosis. Symptoms in retinoblastoma and all forms of pseudoglioma in small children are discussed. Most of these are diagnosed with reasonable certainty; however, it is sometimes difficult to exclude retinoblastoma and enucleation must be performed. Enucleation should be avoided, particularly in metastatic ophthalmia and retrolental fibroplasia which may be amenable to treatment.

Sex Differences in the Incidence of Various Grades of Myopia. M. J. Hirsch. *American Journal of Optometry and Archives of the American Academy of Optometry*. Vol. 30. pp. 135-138. March 1953.

A statistical analysis of the refractive status of 5,201 patients at the Los Angeles College of Optometry Clinic, with respect to sex, reveals that twice as many women as men comprise the myopes of more than 6.00D. Approximately eight women for every ten men demonstrate myopia of less than 6.00D. Thus it is confirmed that higher myopia is more prevalent among women and lower

myopia occurs more frequently in men. Emmetropia and hyperopia, taken as one group, occur with equal frequency in both sexes.

The author feels that the distinct difference in sexual distribution of refractive error above and below 6.00D indicates a possible rationale for the postulation of a number of types of myopia with differing etiology, and that it offers evidence of the validity of using 6.00D as a line of division between the "high" and "low" clinical types of myopia.

Essais d'Emploi des Chimiotherapeutiques et des Antibiotiques dans le Traitement en Serie du Trachome. G. B. Bietti. *Revue Internationale du Trachome*. Vol. 30. pp. 51-109. 1953.

Commissioned by the World Health Organization, the author has studied the effect of sulfa drugs and antibiotics alone or in combination, locally or orally, on trachoma in 2,638 Arab children. Not only was the study of the usual antibiotics projected, but also the establishment of the best directive therapy in countries where there is a high incidence of trachoma. Studies were carried out of therapeutic action on the trachomatous cornea and on the granules.

It was possible to study on one hand the antibiotics effective only on the conjunctival bacteria (streptomycin, thyrothricin, bacitracin, furacyn), and on the other, those effective against the trachoma virus (penicillin, chloromycetin, terramycin, aureomycin). Action was demonstrated not only by the clinical results, but also by the changes in the Hälberstadter-Prowazek bodies. The best results were brought by sulfa drugs orally and antibiotics locally. With this treatment cure is

obtained in three to six months in 70 to 80 per cent of the cases.

Sulfamido-antibiotic therapy is advised in the treatment of trachoma in large populations. It reduces the time of treatment in resistant cases. This treatment can be associated with caustic, astringent or mechanical treatments.

La Pathologie et la Therapeutique du Trachome. A. Busacca. *Revue Internationale du Trachome*. Vol. 30. pp. 209-252. 1953.

Conjunctival changes in trachoma are summarized as follows: Infiltration and edema produce initial distension and probably the proliferation of connective tissue (papillary hypertrophy associated with distension of the basement membrane and increase of the papillary framework). They cause permanent destruction of the adenoid structure which, after resorption of the exudate, cannot be restored as in other forms of conjunctivitis, but rather is replaced by cicatricial connective tissue.

The trachoma virus, unlike other germs, produces substances which provoke disintegration of the fundamental substance of connective tissue and collagenous fibers.

Even at the state of active infiltration, thick fibers appear within the diffuse infiltrate (generally in the upper layers), which are never apparent in normal conjunctiva.

Which Rays Injure the Eyes? A. L. Koven. *Safety Maintenance and Production*. Vol. 105. pp. 30-37. April 1953.

Light is made up of visible rays and invisible rays (infra-red and ultraviolet). Other forms of radiant energy are

X-rays and gamma rays of radium and electricity.

In general radiations of wavelength greater than 2,800 Angstroms (some of the ultraviolet rays, visible rays, and infra-red rays) present little danger to the eyes, while rays of less than 2,800 Angstroms are dangerous. Ultraviolet rays below 2,800 Angstroms produce conjunctival and corneal damage and cause transitory visual disturbances. X-rays and X-radiation may produce cataract, and in larger doses damage requiring enucleation. Electricity can cause cataract by high tension currents and may damage the inner linings of the base of the eye. Sunlight is dangerous only upon looking directly at the sun for a prolonged period. Looking at the sun during an eclipse is particularly dangerous. Very bright artificial light is often injurious to eyes, due sometimes to ultraviolet components and sometimes to infra-red burn.

Light stroke affects improperly protected workers exposed to the light emitted by molten metals, glowing blocks of metal, oxyacetylene arc welding, and electric furnaces. In such exposures an immediate dazzle is followed by transitory partial loss of visual field, and five to eight hours later pain and a sensation of "sand in the eyes." The conjunctiva becomes red and lachrymation and photophobia follow. Mucous secretion of the eye glues the eyelashes together. The entire condition subsides and clears in 12-24 hours.

Electric arc stroke (electric sunstroke or "flash" or "welder's eye") affects workers engaged in and near electric arc welding. It can be produced also by the light from a high tension short circuit, even upon a very

short period of exposure. Such injury is cumulative. Symptoms appear eight to 15 hours after exposure and consist of painful sensation of foreign bodies moving under the eyelids, slight redness of the eye, and photophobia. In acute cases redness and photophobia become pronounced, intense spasm of the eyelid occurs, and the patient has the sensation of a veil before the eyes. In some cases the patient complains of headache and insomnia, and the conjunctiva becomes swollen and inflamed. Recovery takes place completely in a few days.

Snow blindness is caused by reflection of rays from the snow. The symptoms are similar to those of light stroke and mild electric arc stroke. The use of powerful arc lamps and mercury vapor lamps without proper precautions produces watering of the eye, headache, and erosion of the cornea. The condition clears rapidly.

Glassblower's cataract is common in workers exposed to glowing heat (absorption of infra-red rays), and can be prevented by the use of suitable goggles.

Nystagmus, involuntary rolling of the eyes, occurs in miners and other workers who are exposed to insufficient lighting. Night blindness is an early symptom, and tumors of the eyelids, hands, and head may occur along with the nystagmus. The only recommended treatment is daylight or surface work.

What the Eye Physician Expects of the Optician. B. Milder. *Guildcraft*. Vol. 28. pp. 17-34. April 1953.

The ophthalmologist expects the dispensing optician to provide a cosmetically satisfactory end product of eyewear, yielding optimal visual re-

sults with maximal comfort. Selection of types of lenses, frames and bifocal segments is left to the optician, who should consider cosmetic factors, the pocketbook of the patient, and correlation of eyewear with occupation and other usage. A change in frame curve may result in discomfort to the patient. The selection of the proper style of bifocal segment is generally left to the optician unless specific directions are given. For industrial prescriptions or specific visual tasks, it is the physician's obligation to specify the segment type.

Determination of the correct pupillary distance is also left to the optician, since this is an integral part of the mechanical-optical interpretation of the prescription.

Provocative Tests in Primary Glaucoma. J. S. Haas. *Eye, Ear, Nose and Throat Monthly*. Vol. 32. pp. 255-261. May 1953.

Differential tonometric determinations are made before and after provocation of action of the pressure-regulating mechanism of the eye by artificially created situations. Such provocative tests are of value in confirming the diagnosis of glaucoma in patients without definitive elevation of intraocular pressure, in the differential diagnosis of the primary glaucomas, and in evaluating the efficacy of anti-glaucomatous therapy. Gonioscopy should be undertaken prior to provocative tests to differentiate between wide and narrow angle glaucoma and to aid in the selection of the proper provocative.

Angle-crowding tests (Seidel's dark-room test and the mydriasis test) are suitable in testing suspected narrow angle glaucoma (acute), and act by

producing contraction furrows at the periphery of the iris during mydriasis. The resulting thickening of the iris root blocks the trabeculum and causes a precipitous rise in intraocular pressure which persists until mydriasis is overcome by light or miotics. Positive results are obtained only in eyes with an extremely shallow entrance to the angle of the anterior chamber. In the darkroom test the patient is placed in a brightly lighted room for a half hour prior to initial tonometry. Subsequently he is placed in total darkness for one hour, and must be kept awake. Tension is then checked immediately. An elevation of six to eight mm. of mercury is considered significant. The author considers a rise of 10-30 mm. positive. The use of a mydriatic will often provoke a positive rise of intraocular pressure even when the darkroom test is negative. The use of mydriatics is not clinically safe, and should be undertaken only in a hospital; surgical intervention may be necessary to control the resultant rise in intraocular pressure.

Trabecular competence tests are suitable to elicit wide-angle glaucoma and are of particular value in eyes that demonstrate the physical findings of wide-angle glaucoma (cupping of the disc or glaucomatous visual fields) but are without definitive elevation of intraocular pressure. The water-drinking test of Schmidt and Marx is most frequently used. After ingestion of a large amount of hypotonic fluid on a fasting stomach, there is a sudden increase of intraocular pressure when the outflow mechanism is defective. Intraocular pressure is measured every 15 minutes until the pressure returns to normal. A rise of six mm. of mercury or more is suggestive of outflow block.

Tonography is a diagnostic test of adequacy of the outflow mechanism. It is based on the principle that when a weight is applied to the eye for a prolonged period the intraocular pressure tends to fall. Tonometric readings are taken at intervals of 30 seconds.

Analysis of Results with the Massachusetts Vision Test with Recommendations for Improving its Accuracy.

C. D. Benton, Jr., *American Journal of Ophthalmology*. Vol. 36. pp. 363-364. March 1953.

A second screening was undertaken of children who twice failed the Massachusetts vision test. Visual acuity was rechecked by the Snellen type illiterate "E" chart and a number chart. Retinoscopy with +1.5D sph. and +3.0D sph. was done to estimate type and amount of refractive error. Cover-uncover tests were done for distance and near. Maddox-rod and prism tests were done on children who had failed Part III of the Massachusetts test. When intraocular pathology was suspected, ophthalmoscopic examination was made.

The Massachusetts vision test was given to 2,226 school children; 410, or 18.4 per cent, failed twice. Part I accounted for 37.5 per cent of the failures, Part II for 52.5 per cent, and Part III for 10 per cent. Of 304 children who failed the school test and were brought to the clinic, 163 or 53 per cent did not require further study. The remaining 141 children or 46.4 per cent were referred for eye care. Of the referred children, 92.5 per cent were found to need glasses or other treatment.

In spite of errors due to fear and confusion during testing at school, Part I of the Massachusetts test was

found to be 77.2 per cent accurate. However, 78.1 per cent of those who failed Part II at school passed when retested at the clinic. Part II can be improved by using +2.25 diopter lenses for young children and +1.75 diopter lenses for older children. Forty per cent of the failures in Part III were found to have normal muscle balance, whereas 60 per cent had some motor anomaly. No difference was observed between the age groups. Part III of the test is regarded as acceptable in its present form. However, in view of the small number of failures (1.8 per cent of the total test group), and because of its time-consuming nature, it may be omitted when time and personnel are scarce. The following changes in the Massachusetts vision test are recommended:

Part I, Grades 1-3 20/30
 Grades 4-7 20/20

Part II, Grades 1-3 +2.25D. sph.
 Grades 4-7 +1.75D. sph.

Part III, No change

Retrolental Fibroplasia. Part I: F. C. Blodi; Part II: P. C. Parke. *American Journal of Nursing*. Vol. 53. p. 718. June 1953.

Part I. The date and probability of onset of retrolental fibroplasia is inversely related to birth weight. The earliest age at which the disease has been detected is eight days, and the author has never seen it develop after the age of three months. It is always bilateral, although one eye may be more severely involved than the other.

In the early stages the retinal vessels become dilated and tortuous, hemorrhage follows, and the retina becomes edematous. This condition is completely reversible, and 75 per cent

of the infants showing these early symptoms recover with normal or near-normal eyes. In later stages partial and sometimes total retinal detachment occurs. Regression of the disease process may begin at any phase, but is less likely when the lesion is advanced. Activity may be present up to six to eight months of age, and the prognosis does not become clear until that time. The severity of the final or cicatricial phase of retrolental fibroplasia is determined by the extent of progression and regression of the disease in its acute phase. Clinical signs are as follows:

1. In the usual (complete) form the entire pupillary area is obstructed by opaque tissue behind the lens. The fundus is obscured, the anterior chamber shallow, and secondary complications such as glaucoma or corneal opacity may occur.

2. In less severe cases the pupillary area is only partially obstructed and a red reflex on the retina as well as fundus details may be discernable in the unobstructed portion.

3. Milder cases manifest a retinal fold which extends from the disc of the optic nerve to a mass of opaque tissue in the periphery of the fundus.

4. Very mild cases may manifest themselves in larger or smaller masses of opaque tissue in the periphery.

Histologically retrolental fibroplasia is well defined—retinal vessels proliferate in the early stage and new vessels appear in the nerve fiber layer of the retina. Such vessels tend to penetrate the vitreous and form an angiomatous tissue. Organized hemorrhages, newly formed vascular tissue, proliferated glial tissue, and detached and contracted retina together form the substrate of the greyish opaque tissue

seen behind the lens in late retrolental fibroplasia.

Unquestionably the increased numbers of surviving infants with a birth weight of less than two pounds is associated with the increased incidence of retrolental fibroplasia. However, this factor is probably not the sole cause of the increased frequency of the disease. The etiology is not known. It is quite certain that prenatal factors do not cause retrolental fibroplasia. Postnatal factors such as deficiency of vitamins A, D, and E, lack of hormones, premature exposure to light, and breast or formula feeding have had to be discarded as possible precipitants of the disease. Evidence concerning the influence of oxygen on retrolental fibroplasia is inconclusive and contradictory.

No effective treatment of retrolental fibroplasia has been found to date. Only surgery is of any help in the final stage. In an attempt to excise retrolental tissue to clear the pupillary area, poor visual results were obtained. The only preventive measure possible at present is the prevention of premature deliveries.

Part II. Weekly ophthalmic examination for retrolental fibroplasia is part of the routine care of small premature infants at Babies Hospital in New York. Drops are instilled by the nurse one hour prior to examination to dilate the pupils (three drops of two per cent homatropine solution and one drop of 10 per cent neosynephrine ophthalmic solution). Individual solutions and droppers are provided for each infant. The ophthalmologist observes aseptic nursery techniques during his visit. A sugar ball pacifier is used to keep the baby still during the examination.

Accurate records are of the utmost importance in research and are the responsibility of nurses on the ward. Inexact and limited information regarding birth weight, date of onset and duration of oxygen therapy, and regarding reports of reaction to medication such as ACTH hamper research efforts. Rapport should be established between nurses and parents, and the importance of watching the baby's eyes should be stressed both during hospitalization and regularly after discharge. Parents should be made aware of the possibility of retrolental fibroplasia before any involvement is noted.

The Penetration of Neomycin into the Interior of the Globe When Introduced Locally or Generally. G. Lepri. *Rass. Ital. d'Ottal.* Vol. XXI. p. 419. November-December 1952.

Neomycin, introduced by Waksman, and said to be effective against a vast number of gram-negative and gram-positive organisms, as well as the tubercle bacillus, was studied by Lepri. The antibiotic was administered intravenously, subconjunctivally, subcutaneously and by instillation. Experiments demonstrated that neomycin possesses a marked facility of penetration into the anterior chamber, more evident when given intravenously or subcutaneously. Details of the dosage and methods are given.

EUGENE M. BLAKE, M.D.

NEW PAMPHLET

Now available in pamphlet form from the National Society is an article by Marjorie A. C. Young, NSPB Consultant in Education, on "The Partially Seeing—Psychological Aspects." Pub. No. 154; 16 Pages; 15 cents.

BOOKS AND PAMPHLETS

PHYSIOLOGY OF THE EYE. Vol. 2. Vision.

A. Linksz. Grune and Stratton, New York. 1952. 869 p. \$19.00.

This is the second in a series of three books projected by Dr. Linksz. The first dealt with optics, and was published in 1950.

The author's lectures on the physiology of vision form the basis of this volume. Part I, "An Analysis of Sensations," discusses general aspects of sense physiology, and includes schematic diagrams of sensory nerves and graphs of neural responses to stimuli; it also deals with antonyms of sensation, such as light-dark, heat-cold. Wavelength discrimination, or color vision is covered in detail, and various color vision tests are evaluated.

Part II includes five lectures on "Pattern and Detail Vision": color constancy; temporal induction; problems in the physiology of visual acuity; differential sensitivity; the *minimum separabile*, visual acuity and light adaptation, Snellen's letters, stereoscopic acuity, and fixation nystagmus.

Twelve lectures on "Perception of Spatial Relationships" comprise Part III. The neuroanatomy of space perception is discussed; also projection and projectors, distance perception, binocular vision and visual direction. Ames' "equivalent rooms" experiments are considered in great detail in two lectures.

Part IV deals with "Vision and the Oculo-Rotary Muscles": reflexes, dis-

junctive rotations, convergence, fixation, voluntary oculo-rotation, the superordinate reflex arc, Pascal's benzene rings, torsion movements, and fusion.

The volume is well illustrated and includes a comprehensive list of references, as well as an author and subject index.

OPHTHALMIC SURGERY. J. Meller. Sixth Edition. Revised and enlarged by J. Böck, with a supplement by K. Kofler. The Blakiston Company, New York. 1953. 532 p. \$12.00.

The sixth edition of this text is an extensive revision by Dr. Böck, head of the department of ophthalmology of the University of Gratz, and Meller's associate in Vienna for many years. It is Meller's conviction, as emphasized in the preface to the first edition, that thorough training in the entire field of ophthalmology is fundamental as preliminary to the study of ophthalmic surgery. Surgery should be the concluding step in training, when it will require less time and effort than if its study were begun prematurely.

In this book only those operations are described which have been thoroughly tried, evaluated and proved best at the Vienna Clinic. There are 17 chapters, dealing in turn with surgery of the lacrimal apparatus, the lids and orbit; procedures in strabismus, cataract, glaucoma; also optical iridectomy

and keratoplasty; handling of retinal detachment, extraction of intraocular foreign bodies, radium treatment, and use of anesthesia.

An appendix is devoted to "Recent Advances in Ophthalmic Surgery" by Ray K. Daily, M.D. and Louis Daily, Jr., M.D., translators and editors of this edition. The numerous illustrations are exceptionally clear and well reproduced.

OPHTHALMIC PATHOLOGY—AN ATLAS AND TEXTBOOK. Jonas S. Friedenwald, Helenor C. Wilder, A. Edward Mautene, T. E. Sanders, John E. L. Keyes, Michael J. Hogan, W. C. and Ella U. Owens. W. B. Saunders Company, Philadelphia, 1952. 489 p. \$18.00.

This book is an outgrowth of the Atlas of Ophthalmic Pathology by DeCoursey and Ash produced by the Army Medical Museum and sponsored by the American Academy of Ophthalmology and Otolaryngology. Its preparation was instigated by the educational committees of the Academy, inspired by the success of the earlier atlases. Published under the joint sponsorship of the Academy and the Armed Forces Institute of Pathology, it presents a clear and comprehensive coverage of the morphologic pathology of the eye and an exposition of pertinent physiologic processes.

The text embodies the requirements in histopathology for Board certification and is designed to further the instruction of residents in hospitals with limited teaching and laboratory facilities. It furnishes a convenient source for the ophthalmologist pursuing study in the pathology of his specialty.

This is a handsome volume. The ample page size makes it possible to

bring out full detail in the hundreds of plates, which are beautifully reproduced.

REHABILITATION OF THE PHYSICALLY HANDICAPPED. Revised Edition. Henry H. Kessler. Columbia University Press, New York. 1953. 275 p. \$4.00.

This well-rounded treatise deals with the problems of the physically handicapped and the principles and practice of rehabilitation. In a brief section devoted to rehabilitation of the blind, the author stresses the importance of prevention of blindness, educational facilities for the partially seeing, and medical research.

INTRODUCTION TO PHYSIOLOGICAL OPTICS. Armin von Tschermak-Seysenegg. Translation by Paul Boeder, Ph.D. Charles C. Thomas, Springfield, Illinois. 1952. 305 p. \$10.50.

The American Committee on Optics and Visual Physiology sponsored the translation of this text, written primarily for ophthalmologists by an eminent European scientist in physiological optics. The book is dedicated to the memory of Dr. Walter B. Lancaster, chairman of the committee, "who inspired and fostered it as one of his many services to American Ophthalmology."

The work is a comprehensive survey of the field and is regarded as a classic. The complex German text which has heretofore prevented many from becoming closely acquainted with it has been translated by Dr. Paul Boeder, director of the Bureau of Visual Science, American Optical Company, and instructor in ophthalmology at Harvard Medical School, in clear, fluent style, faithful to the original.

Successive chapters, profusely il-

lustrated, deal with the optical image; introduction to the light sense, photometric and physiological factors; introduction to color sense; uniocular space sense; binocular space sense; and the physiology of ocular movements.

A bibliography of the author's other treatments in this field is included.

AMERICAN POCKET MEDICAL DICTIONARY. 19th Edition. W. B. Saunders Co. Philadelphia and London. 1953. 639 p. Plain \$3.25. Thumb-indexed \$3.75.

This pocket-sized dictionary, which defines more than 37,500 entries, is designed to meet the needs of students and practitioners of nursing, pharmacy, dentistry, medical technology, medical stenography, dental hygiene, and veterinary sciences. It is not a substitute for a larger, more comprehensive volume. New terms brought about by advances in science and medicine are included and obsolete terms eliminated in the new edition. Tables of arteries, bones, chemical elements, muscles, nerves, and veins are given adjoining the text entries of these terms.

A HANDBOOK OF OPHTHALMOLOGY. Humphrey Neame, F.R.C.S., and F. A. Williamson-Noble, F.R.C.S. Seventh Edition, 1951. C. V. Mosby Company, St. Louis. 338 p. \$8.00.

In preparing the seventh edition of this handbook these well-known London specialists have "made every effort to retain its elementary character and to omit even reference to the rarer developments in ophthalmology." The text is intended for graduate students and general practitioners and deals in greatest detail with those diseases of the eye which form the bulk of hospital out-patient practice. The more common eye conditions found

among medical in-patients are described briefly.

Among the changes noted in this edition are omission of a description of the reflecting ophthalmoscope, since it has been so completely replaced by the electric instrument except in retinoscopy and indirect ophthalmoscopy; inclusion of one of a series of Professor Amsler's charts for the subjective examination of the macular function; discussion of treatment of corneal ulcers, and recent developments in the use of antibiotics for various conditions.

Many color plates and figures clearly illustrate the text.

NAVAL GUN FACTORY RECORD

Within the ten-year period from 1942 to 1952 the incidence of eye injury at the Naval Gun Factory, Washington, D. C., was decreased from 208 per month to two per month as the result of an extensive program of eye protection and eye correction. This and other arresting facts are reported by L. M. Morris in *Safety Standards*.

In 1942 the only safeguard against eye hazards from chemicals, rays and flying chips of various kinds was a bulky, heavy goggle which was not adaptable to continuous wear. Today an ophthalmologist is stationed in the factory's dispensary. All employees are screened to determine the need for corrective lenses and subsequently fitted with protective equipment ranging from prescription-ground trifocal vision goggles to face shields. One of every three employees not using eye correction was found to need it. Accidents other than eye injury decreased appreciably when the present program of eye protection and eye correction went into effect.